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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 16 1947

THE PROBLEM OF FERTILIZATION*

BY

LORD ROTHSCHILD

Fertilization may be defined as the incitement of the egg to development by a spermatozoon and the conveyance of paternal qualities to the egg (Wilson, 1925). The central problem in fertilization is: What is it that the spermatozoon does to the egg which transforms it from being an inert and somewhat moribund cell into a highly organized and differentiated embryo?

Morphology of Fertilization

Usually the egg is a fairly large cell, in the case of human beings about the size of a small pin's head; this large size is often due to the presence of nutrient material within the cell. The spermatozoon is usually extremely small. It consists of a head entirely composed of nuclear material, a middle piece, the functions of which are not clearly understood, and a vibratile tail. The relative sizes of a human egg and the head of a human spermatozoon are about those of a football and a marble.

The main characteristics of the fertilization reaction are: (1) Both eggs and spermatozoa must be ripe for fertilization to take place. (2) Fertilization is specific; that is to say, crosses between different species or genera can rarely be achieved, or, if they are, the chances of a normal embryo resulting are small. (3) Fertilization is an irreversible phenomenon in nature. (4) Only one spermatozoon fertilizes an egg. (5) After adhesion of the spermatozoon to the egg surface a membrane, the fertilization membrane, is thrown off from this surface. (6) The head of the spermatozoon rotates through 180 degrees when it has passed through the egg surface. (7) The head of the spermatozoon within the egg and the nucleus of the egg travel through the cell on somewhat curved and different paths to meet in about the centre of the egg. Then fertilization merges into cell division and development.

In this brief description there are of course various omissions and generalizations to which there are exceptions. For example, some eggs are fertilized while unripe, while it is common knowledge that interspecific crosses are possible. Even polyspermy occurs on occasion without pathological results. Nevertheless, one must assume that these morphological characteristics are significant and, as such, are particularly worthy of investigation.

The first part of the fertilization reaction occurs immediately after the spermatozoon has adhered to the egg surface. It is called activation, and involves the prevention of other spermatozoa from getting in (the block to polyspermy), the elevation of the fertilization membrane, and the irreversibility of the reaction. F. R. Lillie (1912) centrifuged eggs of the marine worm *Nereis* after the spermatozoa had adhered to their surfaces, the centrifugal force tearing the spermatozoa away from the eggs. Nevertheless, the activation changes referred to above all took place, and chromosomes even started to become visible in the female nucleus.

*Annual oration to the London Jewish Hospital Medical Society, given on April 17.

Permeability and the Biophysics of Fertilization

It would be surprising if unfertilized and fertilized eggs were in the same physiological condition, and one way of investigating what differences, if any, exist between them is by observing the rate at which various substances diffuse in or out of the egg through the egg surface or plasma membrane. For many years there has been a tendency to consider the unfertilized egg as being in an inhibited condition, a condition which is rectified or corrected by fertilization. After fertilization we might expect such alterations in the egg surface as would permit a greater degree of interaction between the egg and its environment. This view received some support from R. S. Lillie (1909), who believed that there might be a similarity between the effects of stimulating an egg by a spermatozoon or parthenogenetic agent and the effects of stimulating a nerve or muscle. One of the characteristics of stimulated nerve and muscle is a temporary increase in the permeability of their cell surfaces, and R. S. Lillie (1917) found the same after fertilization in sea-urchin eggs. This egg swells osmotically when immersed in diluted sea-water, and the amount of water which enters it can be measured. Lillie found that though the total amount of water which enters an egg from sea-water of known hypotonicity is the same before and after fertilization, the *rate* at which osmotic equilibrium is established is significantly increased by fertilization. This means that though the osmotic properties of the egg as a whole are unaffected by fertilization some change in the egg surface occurs which enables water to pass through more easily. Though sparingly ionized substances, such as water, can pass through the surface more easily after fertilization than before, it does not follow that ions, which are electrically charged, will do the same, though it is an increase in the permeability to *ions* which is associated with nerve and muscle reactivity. Consequently there is no reason to expect from Lillie's results that fertilization will necessarily be associated with relatively large changes in the electrical properties of the egg surface. Neither the resistance to electric current nor the voltage, if any, across the membrane need be significantly affected. The same applies to the electrical capacity, though there is a large increase in the electrical capacity of the sea-urchin plasma membrane after fertilization (Cole, 1938). Such an increase in capacity might be caused by this membrane becoming thinner, and it is interesting that, on entirely different grounds, other research workers investigating the effect of fertilization on the permeability of sea-urchin eggs to sparingly ionized substances tentatively came to the same conclusion (Stewart and Jacobs, 1936).

At the same time it has been shown on several occasions that *during* the fertilization reaction acid diffuses out of the sea-urchin egg (Ashbel, 1929; Borei, 1933; Runnström, 1933; Laser and Rothschild, 1939). The acid, which so far has not been identified, is a fairly strong one, and it might be expected that its diffusion out of the

egg would be accompanied by appreciable electrical changes, though these would be very difficult to measure in small eggs. Several attempts have been made to measure such electrical changes, but so far the technical difficulties have proved to be so formidable that the results have been inconclusive (Rothschild, 1938; Gelfan, 1931).

The subject of possible analogies between the response of nerve or muscle to a stimulus, and that of the egg to a spermatozoon, is closely bound up with the observation that normally only one spermatozoon fertilizes an egg. What sort of change is propagated through or round the egg from the point of attachment of the fertilizing spermatozoon which prevents other spermatozoa getting in, and what manifestations of this change can be observed?

The rate of propagation of this change must be relatively fast, because a second spermatozoon cannot fertilize an egg some two seconds after the first one has initiated the fertilization reaction. This means, in the case of a sea-urchin egg, that we can perhaps set a lower limit for the speed with which this change is propagated in the egg. It is unlikely to be much slower than one millimetre per second and may be much faster. This block to polyspermy is thought to be effected long before the fertilization membrane has lifted away from the egg surface, and probably before the breakdown or dissolution of granules in the egg surface, which takes about ten seconds to be completed at room temperature and which is probably associated with the fertilization membrane reaction (Moser, 1939).

Are these changes, which occur during the fertilization reaction, of general incidence, or are they peculiar to sea-urchin eggs, upon which a great deal of the experimental work on fertilization and parthenogenesis is done? In no other eggs has the possibility of acid production on fertilization been investigated. On the other hand, experiments have been done on the permeability of eggs to water before and after fertilization. There is no significant increase in the rate of water penetration into the egg of the annelid worm *Chaetopterus pergamentaceus* after fertilization (Shapiro, 1939). Similarly there is no increase in oxygen consumption after fertilization in this egg as there is in that of the sea-urchin. Actually the rate of oxygen consumption decreases (Whitaker, 1933). It must follow that investigations on the effect of fertilization or parthenogenetic activation in altering the permeability of the egg surface to water or other sparingly ionized substances are unlikely to help in finding common denominators in the fertilization reaction throughout the animal kingdom; though this does not of course detract from their interest in the wider field of elucidating the structure of the cell membrane. This makes the investigation of other eggs from the point of view of acid production during fertilization one of the most urgently required experiments in this field.

Hyaluronidase

There may be about 400,000,000 spermatozoa in a human ejaculation for the fertilization of one, or perhaps two, eggs. The number of spermatozoa can be reduced a certain amount by dilution, but far less than might be expected considering the number of eggs which will be fertilized. It used to be thought that the great number of spermatozoa was necessary to make the probability of fertilization very high. In recent years it has been found that this is by no means the complete explanation, and the discovery that other factors are involved may well have a profound effect on our understanding of the fertilization reaction and also on the treatment of sterility. These discoveries have so far been restricted to mammalian spermatozoa, but they may have some bearing on fertilization in lower organisms, on which so much experimental work has to be carried out. When freshly ovulated, mammalian eggs are surrounded by follicle cells, and it has recently been shown that mammalian testes and spermatozoa contain an enzyme, hyaluronidase, which disperses these follicle cells, or dissolves the substances that make them stick to the egg. It is obviously difficult, if not impossible, for a spermatozoon to come into contact with the egg while the latter is surrounded by these follicle cells, and they must therefore be got rid of before fertilization can take place. The fertilizing spermatozoon is not necessarily among the first lot of spermatozoa which reach the mammalian egg. Their hyaluronidase disperses the follicle cells, leaving the egg bare for subsequent spermatozoa to achieve fertilization. One reason that so large a number of spermatozoa is necessary for successful fertilization is associated with the provision of an adequate concentration of hyaluronidase to disperse the follicle cells. This has been verified by several workers in recent years by artificially inseminating and fertilizing rabbits with suspensions of spermatozoa which were too dilute for successful fertilization under normal conditions, but with hyaluronidase, extracted from dead spermatozoa, added to the sperm suspensions (McClean and Rowlands, 1942). Women have been artificially inseminated, and successful fertilization has resulted, by adding hyaluronidase (extracted from bulls' testes) to semen which previously did not cause fertilization (Leonard and Kurzrok, 1945). Various workers in this field have shown that the amount of hyaluronidase in human semen is proportional to the number of spermatozoa present, which confirms what has been said above about the vital role of this enzyme in mammalian fertilization (Joël and Eichenberger, 1945; Werthessen *et al.*, 1945).

Perhaps more interesting still is the fact that female rats can be immunized against bull testes' hyaluronidase and the immune serum prevents the eggs being denuded of their follicle cells *in vitro*. Furthermore, normal rat semen itself contains appreciable amounts of an inhibiting substance (Leonard and Kurzrok, 1945). There are two implications to this discovery. First, it may be that new methods of contraception may be developed by the use of immunized blood sera; secondly, certain cases of sterility may be due to the inhibiting effect of blood on this enzyme's activity. It is known that the bleeding which is occasionally produced during the dilatation of the cervix at the time of artificial insemination is detrimental to fertilization. Clinical experience has also shown that after normal coitus women not infrequently fail to conceive when bleeding from lesions of the cervix or uterus. It therefore seems possible that certain types of sterility previously attributed to a hypothetical spermatozoon immunity may be due to antibodies formed against hyaluronidase, such antibodies passing from the serum into the uterine fluid and preventing fertilization.

The implications of these discoveries are by no means clear when one considers that the eggs of lower organisms, such as sea-urchins, do not have follicle cells round them. Nevertheless, the number of spermatozoa per egg is still enormous. Many eggs have protein coverings round them. For example, frogs' eggs and sea-urchin eggs when laid are surrounded by a shell of jelly. It might be thought that spermatozoa are so small that they can easily get through barriers of this type, but it is not impossible that the enzyme hyaluronidase plays some part in such cases by facilitating the passage of the spermatozoon through the jelly surrounding the egg. Moreover, there is a species-specific lysin in certain mollusc spermatozoa that dissolves the protein membranes round mollusc eggs (Tyler, 1939a).

In other types of eggs, such as those of the trout, there is a special channel in the outer covering of the egg through which the spermatozoon goes to effect fertilization Even

in such cases an enzyme or lysin of the hyaluronidase type might play a part. Spermatozoa are usually thought to bore their way actively into eggs, but in general this does not seem to be the case. The spermatozoon is often passively absorbed, once it adheres to the egg surface. It is not difficult to imagine that an enzyme of the hyaluronidase type might be necessary for the spermatozoon to pass through the protein surface of the egg.

Fertilizin

One of the most interesting but complicated phenomena associated with the fertilization reaction, at any rate in marine invertebrate eggs, is the appearance of a substance known as fertilizin in the medium round unfertilized eggs. The existence of this substance was first demonstrated by F. R. Lillie (1913), and subsequent researches have shown that it has two main properties. First, suspensions of spermatozoa maintain a higher rate of metabolism and mechanical activity in the presence of these "egg secretions" than in sea-water in which they are not present. Secondly, in the presence of fertilizin spermatozoa come together in clusters which cannot be disrupted by shaking, but which disintegrate spontaneously. The phenomenon is known as agglutination. The agglutinating substance in fertilizin can be used up by spermatozoa, the amount of it in the sea-water round the eggs depending on the number of spermatozoa agglutinated.

In recent years new and important work has been done on fertilizin, in particular by Tyler and his colleagues. Tyler has advanced the theory that the jelly which is found round unfertilized sea-urchin eggs may be fertilizin, and he has produced evidence confirming this. Tyler (1941) has also shown that fertilizin is not essential for fertilization if the presence or absence of fertilizin is judged by the agglutination or non-agglutination of spermatozoa. If the jelly surrounding the eggs of the sea-urchin *Strongylocentrotus purpuratus* is removed and the eggs are washed until there is no sperm agglutination whatsoever in the sea-water round the eggs, the eggs can nevertheless be fertilized with complete success. It is, however, clear that more spermatozoa are needed when the agglutinating substance has been removed, and this suggests that, apart from the agglutinating effect of fertilizin, the sperm-activation effect referred to earlier on has a function in the fertilization reaction. By increasing the activity of the spermatozoa this substance might exert its influence by increasing the probability of any particular spermatozoon reaching and fertilizing the egg, thus reducing the total number of spermatozoa necessary to ensure a high probability of successful fertilization.

The phenomenon of sperm agglutination presents a further problem of great interest and complexity. This effect is spontaneously reversible (F. R. Lillie, 1913); but after agglutinating spermatozoa markedly lose their capacity to fertilize eggs even though their metabolism and mechanical activity are unimpaired (Tyler, 1941). Nor do they agglutinate a second time. This rather suggests that the agglutination of spermatozoa of the same species is a form of false fertilization between spermatozoa instead of between eggs and spermatozoa; or, at any rate, that there is some reaction between the surfaces of the spermatozoa which is sufficiently similar to that which occurs between an egg and a spermatozoon to alter the spermatozoon in an irreversible manner, though in other ways it is still completely normal. The idea of the "muzzled" spermatozoon provides an explanation of a phenomenon which anyone who has watched fertilization under the microscope has observed—that spermatozoa can be seen bumping up against the surface of an egg and then swimming away without having adhered and initiated the fertilization reaction. Perhaps the spermatozoa which do this are the "muzzled" ones, and have been "muzzled" by the agglutinin on their way through the jelly towards the egg surface. The "muzzled" sperm concept provides a further reason for the vast number of spermatozoa needed per egg to obtain a high percentage of fertilization if fertilizin in solution acts as a barrier, in that any spermatozoon which combines with it on the way towards an egg cannot then subsequently effect fertilization (Tyler, 1941). Therefore a lot of spermatozoa are needed to get through the fertilizin barrier in the sea-water round the eggs, leaving the way clear for the fertilizing spermatozoa.

Kuhn and his collaborators extracted a substance, echinochrome A, from the ripe eggs of the sea-urchin *Arbacia pustulosa*. This substance increases the activity of spermatozoa and is considered by this group of workers to be the agent in fertilizin responsible for increasing the activity of spermatozoa (Kuhn and Wallenfels, 1939; Wallenfels, 1943), though this claim has been contested by Tyler (1939b). The chemical similarity between echinochrome and vitamin K_1 may be significant, particularly in view of the latter's role in blood clotting.

Biochemistry of Fertilization

From the point of view of the fertilization reaction, an egg exists in four different conditions: unfertilized, being fertilized; fertilized; and, of course, dead. We should expect that these morphological states will be reflected in the biochemistry and, in particular, in the metabolism of the cell. Consequently Warburg's (1908) discovery that the oxygen-consumption rate of fertilized sea-urchin eggs increases by a factor of six after fertilization was hailed with enthusiasm. Naturally, it was said, the egg must respire at a greater rate when fertilized, because it is an embryo, cleaving and differentiating. In some eggs, however, respiration rates do not change at fertilization; while in others the rate actually goes down (Whitaker, 1933). In any case the oxygen consumption of unfertilized sea-urchin eggs can be increased to the fertilized level by special means such as the addition of pyocyanine, or even perhaps by an increase of temperature, without activation occurring (Korr, 1937; Laser and Rothschild, 1939). The truth is that the mere measurement of oxygen consumption is inadequate as an index of metabolic activity. To investigate the biochemistry of fertilization we must probe more deeply into the fine structure of cellular metabolism and find out the precise chemical nature of the reaction cycles measured by the disappearance of oxygen and the liberation of carbon dioxide. This, of course, applies only in those cases where the reaction depends on the availability of oxygen.

The availability of oxygen is mentioned because some eggs, at any rate, can be fertilized in the absence of oxygen. Activation may therefore be an anaerobic phenomenon. This is confirmed by the fact that activation, including acid production, can take place in the presence of cyanide, which inhibits the oxidative cycle of reactions catalysed by the cytochrome system. If activation is an anaerobic process the possibility arises that the acid which diffuses out of the egg during the fertilization reaction is a product of anaerobic glycolysis. This suggests some interesting experiments, for we know in some detail the chemical reactions which go to make up the anaerobic glycolysis cycle, and also how to cause inhibition at various points in the cycle. Of course there are anaerobic metabolic systems which are entirely different from glycolysis, which starts with the breakdown of carbohydrate and ends with the production of lactic acid or alcohol. An example is a system of the cysteine desulphurase type, which anaerobically splits cysteine into hydrogen sulphide, ammonia (a

compound containing ammonia is said to be formed by sea-urchin eggs during fertilization: Örström, 1935), and pyruvic acid.

Another line of investigation is to measure the respiratory quotient during activation, technically a very difficult experiment. There is evidence (Laser and Rothschild, 1939) that the respiratory quotient is rather low during activation, which suggests that activation is associated with the breakdown of fats or proteins rather than carbohydrates.

These facts and speculations about metabolism during the early phases of the fertilization reaction suggest that activation may be associated both with anaerobic processes and with aerobic ones involving the breakdown of fats or proteins. The latter may have an inhibitory effect on the former, including acid production. The inhibitory effects of aerobic processes on fermentation are well known, and the possibility of such a Pasteur effect in the fertilization reaction could be investigated by specific Pasteur-effect poisons such as ethyl carbylamine.

So far we have discussed only the fertilization reaction. There is the separate problem whether there is any metabolic difference between unfertilized and actually fertilized eggs. The researches of Runnström (1933) and Korr (1937) have led to the rather attractive theory that fertilization induces a cytochrome type of metabolism, while the unfertilized egg respires through a non-ferrous autoxidizable carrier of the flavin or pyocyanine type, the cytochrome being present but inactivated. The evidence for this theory is too complicated to discuss in detail here, other than to mention that cyanide is stated to have little inhibitory effect on unfertilized eggs, but a marked effect on fertilized ones. How is cytochrome inactivated in the unfertilized egg? It is well known that changes in the physical state of the egg protoplasm take place as a result of fertilization (Mirsky, 1936; Mazia, 1937; Monroy and Montalenti, 1946); these might result in the activation of cytochrome, but there is no evidence that they do. Korr and Runnström's results have recently been disputed (Robbie, 1946), and it is therefore urgently necessary to repeat the experiments, which, from a technical point of view, are comparatively simple.

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INFLUENCE OF PENICILLIN ON THE COAGULATION OF BLOOD

WITH ESPECIAL REFERENCE TO CERTAIN DENTAL OPERATIONS

BY

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Certain minor operations in oral surgery depend for their success on the organization of a firm blood clot in a cavity in bone. This is particularly the case in the operation of apicectomy, where the excision of the end of the tooth root leaves a small but appreciable cavity in the bone covered only with a thin flap of mucoperiosteum. If the clot in this cavity breaks down the sinus which forms leads down to the cut surface of the tooth root and permits it to become infected.

Since penicillin has been available it has become a common practice to introduce the powder into the cavity before suturing. Such an amount of powder may, however, represent as much as 10,000 units or more of penicillin, and a marked tendency for the clot to break down has been observed in cases so treated. Because of this, experiments were made to see whether penicillin had any action on the coagulation time of blood or on the contraction of the clot.

The first experiment was carried out with an impure commercial penicillin (sodium salt) containing 361 units per mg. Of this, 100,000 units was dissolved in 0.5 ml. of normal saline, and serial dilutions (0.25-ml. volumes) were made in normal saline, leaving one volume of normal saline as a control. Normal human blood was then taken from a vein and immediately 0.25-ml. volumes were added to each tube and mixed. The tubes were then observed and the time which elapsed before clotting took place was recorded. A later examination was made to see whether or not the clot had contracted.

It was thought that the anticoagulant effect observed might be due to the impurities in the penicillin, so the same experiment was repeated using pure crystalline sodium salt of penicillin, and in the accompanying table the results are contrasted with those obtained with the impure salt. It will be seen that the result with crystalline penicillin differed only in detail from that with the very impure commercial product, showing that penicillin itself has a considerable retarding action on blood-clotting.

Table showing effect of Penicillin on Coagulation Time of Human Blood

Final Concentration of Penicillin in Blood (Units per ml.)	Coagulation Time	
	Impure Penicillin	Crystalline Penicillin
50,000	No clot in 24 hours	No clot in 24 hours
25,000	" "	" "
12,500	" "	" 32 minutes
6,250	" 75 minutes	11 "
3,125	7 "	7 "
1,562	4 "	5½ "
781	—	5 "
340	—	2½ "
170	—	2 "
Control	2 minutes	2

Effect on the Contraction of the Clot

In the first experiment, with impure penicillin, it was noticed that in the tube containing 6,250 units per ml., in which clotting was much delayed, the clot did not contract. In the observation with pure penicillin the whole of the serum was drawn off after 24 hours and its volume measured. The amount of serum obtained from the control was considerably greater than that from any of the tubes containing penicillin, indicating that even so little as 340 units per ml. had some retarding effect on the contraction of the clot.

Conclusions

These results have no bearing on the systemic application of penicillin, as the concentration of the drug in the blood is then in the region of only 1 unit per ml. or less. However, it is quite easy to introduce locally sufficient to interfere seriously with coagulation and contraction of the clot.

It would appear, therefore, that the local use of penicillin in an operation where the formation of a firm blood clot is of importance should be limited to washing out the cavity with a solution of the drug not exceeding 100 units per ml. This could, of course, be combined with intramuscular injections if there is any reason to fear wound infection by penicillin-sensitive organisms.

IRRADIATION OF GASTRIC CANCER*

BY

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While encouraging progress has been made in dealing with cancers in more superficial and accessible sites, cancer of the stomach still remains a problem. It is responsible for 13,000 deaths annually in Great Britain, and 40,000 in the U.S.A. (Wilbur and Shenson, 1942)—that is, 33% of all cancer deaths in America (Mullen, 1941). But, worse still, its highest incidence in men and women is between 40 and 60 years, when they have established a place in life, a home, and a reputation; when they are most useful to their profession and their country, and most necessary to their families (Ogilvie, 1945). It is the commonest type of cancer, with the worst results from treatment, for on the average only 1–4% of all cases are alive after five years following curative surgery, and only about four months' prolongation of life can be obtained by palliative operations (Livingston and Pack, 1941).

What can be done to decrease this annual toll of valuable lives? Apart from the possibility of prevention, about which we are able to do little until we know more of the causal factors, the problem is one of diagnosis and treatment. Early diagnosis is particularly important, for we know the vast majority of patients can be cured if treated by radical surgery when the disease is localized to the stomach. But at present some 80% of cases of gastric cancer are beyond any hope of cure by surgery alone when first brought to the surgeon (Ogilvie, 1938). In spite of the tremendous advances that have been made in the surgical treatment of this disease during recent years, radical surgery can hardly become more radical, for physiological or technical reasons. Its limitations are set by Mayo's dictum that a live patient is one of the essentials of a successful operation, and not by timidity and lack of enterprise by surgeons (Ogilvie, 1945). But what of irradiation—for post-mortem findings show that over 20% of people dying of gastric cancer have the disease still confined to the stomach and immediately adjacent lymph glands (Livingston and Pack, 1939)? Owing to the impossibility of a surgical cure in such a vast number of cases, many other forms of treatment, including irradiation, have been tried in the past, but without striking success. Hardly had Roentgen discovered *x* rays in 1896 when Despeignes applied them to the external irradiation of a gastric cancer.

There is no need for us to recall the different forms and combinations of irradiation applied to this viscus from then to the present day. It should suffice merely to make some general remarks on their limitations and shortcomings.

External irradiation fails because of the deep situation of the gastric tumour and its close relation to other vital organs—both factors tending to prevent adequate tumour dosage—and because of the high but variable radioresistance of gastric cancer cells, possibly increased by infection. This high resistance may be only apparent, owing to limitation of the tumour dose by severe general and skin reactions. Movements of the tumour make accurate centring of the *x*-ray beam at repeated exposures difficult to obtain. Livingston and Pack (1941) stated that most patients will not survive long enough to benefit from prolonged external irradiation alone because of the profound state of malnutrition many of them attain.

Contact therapy with the Chaoul tube covers a relatively small area (2 cm. diameter) in each field with very little penetration at low voltage. Pack (1939) found that only 22% of the surface dose penetrated to 1 cm. below the surface. For comparison, Fairchild finds that 32% of the surface dose of high-intensity irradiation penetrates to 10 cm. below the surface with the technique he has been using. With the Chaoul tube bulky tumours could not be destroyed by single surface doses at one operation, but needed repeated exposures. This could be done only through some kind of fistula or pouch formation. With such a small field of 2 cm., repeated applications would be required for most inoperable tumours, with the obvious difficulty of adequate and uniform dosage. Also, such localized irradiation would have no appreciable effect on any glandular or other local spread, the presence of which is the usual reason for inoperability.

Radon seed implantation has the same difficulty of uniform and adequate dosage (as shown by subsequent radiography) when introduced at operation from either serous or mucous surface, or through a gastrostomy opening or the oesophagoscope. There are also dangers of haemorrhage and infection and perhaps perforation due to massive necrosis of the tumour, while the adjacent field of spread does not receive adequate irradiation.

Intracavity irradiation with the five-way tube described by Livingston and Pack (1941) has, they claim, the advantages of easy application, fractionation of doses, avoidance of damage to adjacent vital organs, freedom from dangers of haemorrhage, infection, and perforation, and no interference with food intake. But they had not at that time determined how effective a total dose patients would stand, the most effective fractions into which to divide the total dose, or the results as regards palliation or cure. Used

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alone it would appear not to have much effect on local spread, but combined with direct irradiation it might perhaps be used to supplement the dose reaching the centre of large gastric tumours.

Many people think that irradiation not only shortens the patient's life but also adds to his sufferings, and therefore is quite unjustifiable. While this may be true of many of the other methods of treatment we maintain that direct irradiation at high intensity has none of these disadvantages.

Direct Irradiation

Because of the lack of any striking results from these forms of attack on gastric cancer, Fairchild (1935) first conceived the idea of direct irradiation of deep-seated tumours exposed temporarily at operation. Owing to difficulties associated with anaesthesia and the length of time required to give an adequate dose (at the rate of 40 *r* per minute—the maximum possible at that time) a compromise was attempted. Some cases of rectal cancer were treated by external irradiation applied posteriorly, after turning back skin-flaps over the sacrum and coccyx. By this means adequate tumour dosage was not obtained, so fractional doses were applied daily for a week or ten days. But the wounds became infected when kept open for so long, and the method was abandoned. Further progress was held up until 1944, when Fairchild and Shorter began to work out a technique for the direct irradiation of gastric cancers exposed temporarily at operation as had been originally intended, instead of merely turning back skin-flaps. Using the intensities then available (700 *r* to 2,000 *r* per minute), the method was later elaborated to deal with cancers of the oesophagus, pancreas, colon, etc.

Advantages of the Method

1. More accurate information about the size, shape, position, and extent of the primary lesion, and any local or general spread, can be obtained at the exploratory operation than can be found out by any other methods, either clinical or laboratory. In the thorax, where we can usually make a fairly satisfactory radiological examination, the extent of a cancer is almost invariably greater than it would seem from *x*-ray films. So in the abdomen the growth is nearly always more extensive than can be determined by the usual examinations and investigations. According to Walters *et al.* (1942), exploratory operation is the only reliable way of deciding the correct form of treatment.

2. Biopsy specimens can usually be obtained to help confirm the diagnosis. With palpable glandular involvement this can be done safely, but incision of the tumour may spread tumour cells or lead to perforation owing to subsequent massive irradiation. Thus biopsy may not be practicable in all cases, but being able to see and feel the tumour should make the diagnosis more certain than when relying on external methods of examination alone.

3. A more accurate and effective dose of irradiation at high intensity can be given direct to the tumour and field of local spread without irradiating such a large volume of normal tissue, including vital organs and skin, unavoidable when irradiating from the skin surface. This may be of great importance in an already anaemic and cachectic patient.

4. More accurate centring of the *x*-ray beam is possible under direct vision than when relying on *x*-ray films or clinical examination alone.

5. The skin is left practically intact, and will permit further full dosage to be given externally at a later date should this be deemed necessary. Supplementary external irradiation was given later in some of our earlier cases, beginning about ten days after operation, as we felt that the initial dose was too small to cure. Some had further external irradiation after some months.

6. Various operations to relieve obstruction can be performed before the irradiation, at the same or an earlier and less extensive laparotomy, such as gastrostomy for cardiac obstruction and gastro-jejunostomy for pyloric lesions. Though the obstruction may not be severe it increases owing to fibrosis of the tumour after irradiation. In hopeless cases these operations can be done without irradiation to relieve symptoms.

Preliminary Investigations and Pre-operative Preparation

Diagnosis and localization of the tumour are achieved as accurately as possible by clinical, radiological, gastroscopic, oesophagoscopic, and laboratory investigations. The general condition of the patient is investigated as regards possibility of metastases, state of nutrition, and fitness for anaesthesia and operation.

Patients with cancer of the upper alimentary tract are often bad risks for operation or irradiation. This varies considerably with the site and type of growth, the degree of interference with nutrition, infection of the tumour or even the whole mucosa, and toxaemia from the growth. The patient with cancer at the cardia or pylorus is usually a worse risk than the patient with a mid-gastric lesion, owing to the more profound disturbance of nutrition, even amounting to gross deficiencies of many vitally important substances. These deficiencies must be made good, before any extensive operation or intensive irradiation is carried out, by means of a high-protein, high-carbohydrate, low-fat diet, with extra fluids, iron, salts, and vitamins when necessary (Payne, 1940; Reid, 1941; Garlock, 1942; Ravdin *et al.*, 1943; Wangensteen, 1943). Infection is combated in the tumour, or in the stomach generally in pyloric obstruction, by daily gastric aspiration and lavage with weak hydrochloric acid solution. Dental sepsis, so often associated with upper tract cancers, is attended to before general anaesthesia. Routine coughing and breathing exercises are begun before operation and continued as soon as possible after operation, to maintain a clear airway and good expansion of the lungs (Shorter, 1944). This is the most important measure in avoiding lung complications after upper abdominal operations, especially when the thorax is opened as well.

Surgical Approaches

Owing to the tendency of the growth to spread along the stomach, or to lymphatics above, behind, or below the stomach, the exposure must be such as to enable the direct irradiation to be carried out in an antero-posterior plane; otherwise uniform irradiation of the tumour area would not be possible. It follows that the left transthoracic approach is unsuitable for direct irradiation even for the cardiac area and lower oesophagus (Shorter, 1946).

This may be in one or two stages (Fairchild and Shorter, 1945). (1) When there is well-marked cardiac or pyloric obstruction gastrostomy, gastrojejunostomy, or even jejunostomy may be necessary before the patient's condition can be improved sufficiently to stand the wider exposure and irradiation. This is usually done through a small upper left paramedian incision, making exploration of the tumour and the whole abdomen possible. Many cases have in this way been found unsuitable for irradiation owing to unsuspected widespread metastases. (2) When the patient's condition seems satisfactory the abdomen is explored through a different incision more suitable for extension, even into the thorax if necessary. We have usually followed this practice when the condition of the patient will allow it, so as to avoid the two operations advocated by Garlock (1941, 1942). Also it saves moving the patient between making separate incisions for the exploration and the main exposure (Churchill and Sweet, 1942a, 1942b). The form of treatment to be carried out cannot be decided upon beforehand,

so preparation must be made for all contingencies so far as is possible. The abdomen must be thoroughly explored before making an extensive exposure, especially before opening the thorax. It would seem to be unwise, and unfair to the patient, to open his thorax and divide his diaphragm before estimating carefully the extent of spread in the abdomen (Shorter, 1946).

(*a*) *Midline Incision.*—In our early cases the main approach was through a midline incision from the sternum, excising the xiphoid, to the umbilicus or beyond. With a narrow subcostal angle, the wound was widened by dividing each costal margin and forcibly retracting. Then the tumour was mobilized to bring it down into the open wound. This method was soon abandoned in favour of leaving the tumour *in situ* and retracting the abdominal and perhaps thoracic wall to give direct and wider exposure.

(*b*) *Angular Abdomino-thoracic Incision.*—For upper gastric tumours a transverse incision was made through the sixth and seventh left costal cartilages from the upper end of the midline incision, and continued round in the fifth space to the posterior axillary line. The thorax was opened and the left side of the diaphragm divided down to the oesophageal hiatus, the incision skirting round the left edge of the pericardium. This method caused less operative shock and decreased the risk of spreading the disease by lymphatic embolism, owing to decreased manipulation of the tumour. Also it gave better access to the cardiac region, though some difficulty was experienced in retracting the angular flap containing the divided left costal margin.

(*c*) *Oblique Abdomino-thoracic Incision.*—In our later cases this difficulty was overcome by an oblique incision across the upper abdomen, from the ninth right to the seventh left costal cartilage, in line with the outer part of the fifth left interspace. The incision was continued through the left costal margin lower down into the fifth interspace, the thorax opened and the diaphragm divided as before. This gave a wide straight opening with much better direct access to the whole stomach.

We have found this oblique incision most useful for gastrectomy and oesophago-gastrectomy. Garlock (1946) has recently described a somewhat similar combined abdomino-thoracic approach to the lower oesophagus and cardia, but he explores the abdomen through an upper left pararectal incision, which may be continued into the thorax through the ninth left interspace.

Points in the Operative Procedure

When operations to relieve obstruction are necessary they are done before the irradiation, and when possible in an area of the stomach not to be irradiated. Irradiation of normal viscera, so far as is possible, is avoided by displacement and packing out of the field. In our earlier cases lead screening was used to protect the skin edges of the wound. More recently we have introduced a special sterilized applicator into the wound. Sterilized oiled silk protects the field against infection during irradiation but allows accurate visual centring of the tumour in the *x*-ray beam. To avoid shock produced by frequent moving, a special trolley has been designed on which the patient can have both the operation and the irradiation.

Radiological Data

The apparatus consists of two Metropolitan Vickers constantly evacuated *x*-ray tubes of the 250-kV type. Special modifications in the layout and in various components of this apparatus have been made, so that both tubes may be used simultaneously in treating a single lesion. This has been done to increase the intensity above that available with the standard apparatus. The lower tube has a vertical traverse only, whereas the overhead tube has a vertical and horizontal traverse. The beam of each tube can be rotated through 300 degrees in a vertical plane. With the use of radiation giving a half-absorption value of 1.7 mm. Cu, the available surface intensity is of the order of 1,000 *r* per minute from each tube. In each case the focal skin distance is 21.7 cm. and the field 13 cm. in diameter.

Methods of Irradiation.—In our original method only one tube was used to administer a single dose of radiation direct to the lesion. This was followed in ten days by a further dose given through the skin. In our later cases this method was modified in an attempt to give an adequate total dose of irradiation at one exposure, with more uniform distribution, so as to avoid the necessity for subsequent external irradiation. For this purpose the overhead tube was used as before, while the lower tube, with the *x*-ray beam directed upwards, was arranged beneath the patient, with the canvas trolley-top alone intervening. The central ray of each beam was so directed as to pass through the centre of the lesion. In our first method, with one tube, the total initial tumour-surface dose was 500 *r*–1,200 *r*, the latter figure being chosen as a maximum because it had been effective in certain superficial lesions. Also it was thought that a larger dose might cause massive necrosis of tumour tissue, with a risk of haemorrhage and perforation, there being no precedent to indicate the probable effects of such high tumour doses given with a maximum of two to five minutes. In our second method a provisional average tumour dose of 1,300 *r* was decided on as a minimum throughout the tumour, entailing a surface dose of 1,300 *r* from the under-couch tube and 1,600 *r* direct to the lesion from above. This latter dose is being gradually increased.

Post-operative and Irradiation Reactions.—Immediate reactions have been no more severe than would have been expected after the operation alone, which often involved extensive exposure of the viscera, with both thorax and abdomen widely open together, and much manipulation during isolation of the tumour. Even after giving 3,000 *r* in three minutes there has been remarkably little irradiation reaction, which has come on seven to ten days later, when the operation reaction has passed off. It has been mostly limited to nausea and anorexia, with rarely any vomiting or diarrhoea. Blood changes have been less severe than usual after external irradiation, when the dose is spread over a longer time and a far greater volume of tissue and blood is treated. Irradiation reaction has been more severe and the recovery much slower after the external irradiation given to certain of our earlier cases some months after the operation and direct irradiation, even though the patients were generally more fit for the later treatment, which was a relatively smaller dose spread over a few weeks.

Results of Treatment

During the past two and three-quarter years 32 cases of inoperable gastric cancer have been investigated. Of these patients three refused all treatment and left hospital, and one was considered unfit for exploratory operation, being a man of 80 with a large palpable tumour of the lesser curve. The remaining 28 cases were explored. Three of these were unfit for further treatment—one due to widespread growth and poor general condition; another due to extensive residual growth and insuperable adhesions following partial gastrectomy; and the third due to extensive growth with perforation of a carcinomatous ulcer. Ten of those explored were found unfit for direct irradiation owing to too extensive growth or poor general condition, or both, and had palliative operations only.

This leaves 15 cases that were treated by direct irradiation. These can be divided into two groups—first, a group of seven cases in which the irradiation was purely palliative owing to obvious spread beyond the possible field of irradiation or to poor general condition. Of these, one is

alive and well after five weeks; one lived six months, one five months, and two four months; while the rest died sooner. In the second group of eight cases the growth appeared to be limited to an area that could be irradiated. Of these, one lived 24 months, two 15 months, one seven months, one four months, and one three months after treatment. The remaining two died within the first week—one from bilateral pulmonary collapse while the wound was being closed, the other from spontaneous pneumothorax on the opposite side four days after operation.

Details of Cases

The following are brief details of some of our cases in chronological order, as we proceeded with and modified our technique.

Case 1.—A man aged 35, with carcinoma of the lesser curve, had a laparotomy on Feb. 15, 1944, via the upper midline incision, widened by division of both lower costal margins. The tumour was a large elongated flat plaque extending from 2.5 cm. short of the pylorus to the cardia; its surface was stony-hard, irregular, and with subserous spread. It measured 13 cm. vertically, 7 cm. antero-posteriorly, and 4.5 cm. thick. The rest of the stomach was normal. Spread to glands or viscera was not found. A biopsy was not made, but surgeon, radiotherapist, and pathologist were all sure of the diagnosis. The tumour was irradiated with one tube, the maximal tumour dose being 1,000 *r* in one minute. External irradiation was begun nine days later, amounting to a maximal tumour dose of 970 *r* in 12 days. The total maximal tumour dose was 1,970 *r* in 21 days. The tumour decreased very much in size, with marked contraction of the stomach also. The patient's appetite soon returned, and he was able to eat any food without indigestion. As his stomach became smaller it emptied more rapidly, so that he had to take small meals frequently. He gained over 2 stone (12.7 kg.) in weight after treatment, and returned to work as a newspaper reporter within six months. He was readmitted to hospital at the end of December, 1945, and died from widespread metastases in February, 1946, just over two years after the direct irradiation. Post-mortem examination showed growth in the whole stomach, throughout the chest and abdomen, and in the brain. This was our first patient; he had a relatively small dose of irradiation and lived two years, most of which time he was free from any symptoms.

Case 2.—A man aged 67, with carcinoma of the pyloric antrum, had a laparotomy on Feb. 22, 1944, via the upper midline incision. The tumour was a hard irregular cylindrical mass encircling the pylorus and pyloric antrum, 6.5 cm. long and 5 cm. across. Glands in the lesser curve were taken for biopsy, and were reported on as early infiltration with carcinoma cells compatible with stomach primary carcinoma. The tumour and glands were irradiated with one tube, the maximal tumour dose being 1,000 *r* in 1.5 minutes. External irradiation was begun in nine days, but was stopped after a few days (275 *r* maximal tumour dose) owing to the development of a lung abscess. External irradiation was restarted six weeks later with a further 1,089 *r*. The total maximal tumour dose was 2,364 *r* in 56 days. Almost complete pyloric obstruction developed owing to fibrosis and contraction in tumour after irradiation. No improvement took place by May 30, 1944, so a gastro-jejunostomy was performed. The patient died of heart failure within a week. The second operation could have been avoided had a short-circuit been done at the first operation, though the patient was in poor condition then. The irradiation given was inadequate, but a larger dose was precluded by the patient's poor condition.

Case 3.—A man aged 60, with carcinoma of the greater curve, had a laparotomy on April 4, 1944, via the upper midline incision. The tumour was a large irregular stony-hard mass on the greater curve in the pyloric antrum measuring 13 cm. transversely, 7 cm. vertically, and 7.5 cm. antero-posteriorly, with an ulcer 7.5 cm. across facing into the lumen of the stomach. The tumour was attached to and invading the pancreas. There was a subserous spread on the surface of the tumour, and some was removed for biopsy. The report stated that there was a large spheroidal and round-celled adenocarcinoma of the stomach with well-marked mucoid change. No other spread was found. The tumour was irradiated with one tube—maximal tumour dose, 1,000 *r* in 1.5 minutes. External irradiation was begun nine days later, amounting to a maximal tumour dose of 991 *r* in six days. The total maximal tumour dose was 1,991 *r* in 16 days. His pain disappeared within a few weeks of the direct irradiation, his general condition quickly improved, his appetite soon returned, and he returned to work as a stoker five months after direct irradiation, having gained 1½ stone (9.5 kg.) in weight. He was readmitted for further external irradiation on Nov. 23, 1944, as it was thought the initial dose was too small to cure the lesion. The second maximal tumour dose was 2,646 *r* in eight days. Systemic reaction was more severe and his recovery was much slower after this, but he continued to improve. He began vomiting at the end of March, 1945, owing to obstruction at gastro-jejunostomy by contraction of the growth after treatment. He continued to vomit but refused further operation until the end of June, 1945, by which time his general condition was very poor. At this operation the duodenum proximal to the anastomosis was joined to the jejunum beyond, but he died a few days later from intestinal obstruction by a volvulus after the operation. Post-mortem examination showed growth in the stomach, mostly outside the treated area. He lived 15 months after the direct irradiation, and might well have lived longer if he had allowed us to perform the second operation sooner.

Case 4.—A woman aged 54, with a leather-bottle stomach from pylorus to cardia, had a laparotomy on May 9, 1944, via the upper midline incision. The stomach was stony-hard from pylorus to cardia. Glands were found high in the lesser curve and below the pylorus. Biopsy of the gland showed undifferentiated glandular carcinoma. The tumour and glands were irradiated with difficulty with one tube, as it was impossible to get the whole lesion into the field of irradiation. The maximal tumour dose was 950 *r* in 1.6 minutes. External irradiation was begun nine days later, amounting to a maximal tumour dose of 2,310 *r* in 13 days. The total maximal tumour dose was 3,260 *r* in 23 days. She improved for a time and was quite free from pain. Her appetite did not improve, and she died at home four months later. A necropsy was not done.

Case 5.—A woman aged 57, with carcinoma of the abdominal oesophagus involving the cardia, had an angular abdomino-thoracic incision on May 16, 1944. The abdomen was explored and a small stony-hard pear-shaped tumour 5 cm. long by 2.5 cm. across was found encircling the abdominal oesophagus. There were no signs of spread. The incision continued into the thorax, but no spread was found there. Operation was not possible owing to the poor general condition. The tumour was irradiated with one tube, with a maximal tumour dose of 1,000 *r* in 4.26 minutes. External irradiation was begun in nine days, amounting to a maximal tumour dose of 2,541 *r* in 11 days. The total maximal tumour dose was 3,541 *r* in 20 days. Her general condition improved, and swallowing, which was previously limited to fluids, was very much better. She gained some weight. Further external irradiation to cover the length of the mediastinum and lesser omentum was begun on March 12, 1945. The maximal tumour dose was 2,046 *r* in four days. The systemic reaction was severe, but her general condition slowly improved. Swallowing became almost normal. Then she developed a pyrexia and died suddenly on Aug. 23, 1945—15 months after the direct irradiation. Necropsy showed death to be due to broncho-pneumonia and cirrhosis of the liver. There was no sign of viable cancer cells in the irradiated area, but some were found in the right lung base. This was the first gastric case for which we opened the thorax and abdomen together.

Case 6.—A woman aged 42, with carcinoma of the cardia, had an angular abdomino-thoracic incision and her abdomen explored on Nov. 14, 1944. A tumour about 6 cm. in diameter was found involving the cardia and abdominal oesophagus. Glands were found around the left gastric vessels; no other sign of spread was discovered. Biopsy of glands did not show any involvement with carcinoma cells. Incision continued into the thorax, but the general condition of the patient was too poor to allow direct irradiation or gastrectomy to be carried out, and the wound had to be closed hurriedly. Another attempt was made to expose the tumour for irradiation on Jan. 16, 1945, through the oblique abdomino-thoracic incision.

Great difficulty was experienced with adhesions, and again the operation had to be terminated rapidly before completion. The patient died some 36 hours later. Post-mortem examination confirmed the carcinoma encircling the cardia and lower abdominal oesophagus, causing complete obstruction. No other possible signs of spread were observed except the glands found at operation. Unfortunately this patient had been treated as a case of achalasia for some eight months, in spite of losing 2 stone (12.7 kg.) in weight and having gradually progressive symptoms.

Case 7.—A woman aged 46, with carcinoma of lesser curve, had a laparotomy on Nov. 21, 1944, via the upper midline incision. A saddle-shaped tumour 8 cm. transversely by 5 cm. vertically by 4 cm. thick was present on the lesser curve in the pyloric antrum and body. Hard glands were found along the lesser curve and below the pylorus and body of the pancreas. Biopsy of glands revealed infiltration by mucus-secreting carcinoma, showing little differentiation and increased fibrous stroma as in leather-bottle stomach. The tumour and glands were irradiated by two tubes, the maximal tumour dose being 1,528 *r.* in 2.4 minutes. The patient withstood operation and irradiation very well, but suddenly collapsed and died just as the wound was being closed. Necropsy showed complete collapse of both lungs, for which no cause, either intra- or extrapulmonary, was found.

Case 8.—This patient, a woman aged 54, had a carcinoma of the lesser curve. Her abdomen was explored via an oblique abdomino-thoracic incision on March 23, 1945, and a saddle-shaped tumour measuring 8 cm. transversely by 4 cm. vertically by 4 cm. antero-posteriorly was found high on the lesser curve, extending a quarter-way round the lumen on each surface; it was stony-hard, nodular, with subserous spread. There were glands along the lesser curve. Biopsy showed moderately differentiated adenocarcinoma with much fibrous stroma invading the lymph gland. There was no other sign of spread. The incision was continued into the thorax. The tumour and glands were irradiated with two tubes, a maximal tumour dose of 1,542 *r* being given in three minutes. Her general condition improved, her appetite returned, and she gained in weight and lost all dyspepsia. Her stomach had contracted considerably some five months after irradiation, and she had to have frequent small meals. Later, she would not take much food because of the return of pain, and then vomiting began. Her abdomen was explored through a left paramedian incision on Sept. 28, 1945, when much clear fluid was found, with miliary peritoneal spread of carcinoma. A palliative jejunostomy was performed, but she died within a week. Necropsy showed widespread involvement of the parietal and visceral peritoneum and omentum, with metastases. The stomach was greatly contracted and showed infiltration by growth from pylorus to cardia.

Case 9.—A man aged 68, with carcinoma of cardia, had the abdomen explored through an oblique abdomino-thoracic incision on Feb. 13, 1945. A tumour 6 cm. transversely by 4 cm. vertically by 3.5 cm. antero-posteriorly was found at the cardia. There were glands in the lesser curve and above the cardia, but no spread was observed elsewhere in the abdomen. Biopsy of the glands showed poorly differentiated adenocarcinoma invading the lymph-gland. The incision was continued into the thorax, but no spread was found there. The tumour and glands were irradiated with two tubes, the maximal tumour dose being 1,196 *r* in 1.8 minutes—smaller than intended because the lower tube became unstable and was turned off. The patient progressed very well for four days, when for no apparent reason spontaneous pneumothorax suddenly developed on the right side, causing rapid death from heart failure in spite of all attempts at resuscitation.

Conclusions

To summarize our results, 15 out of 32 cases were treated by direct irradiation. In eight of these the disease appeared to be limited to an area that could be irradiated, and of this group one lived 24 months, two 15 months, one seven months, one four months, and one three months after treatment.

Although the series is small we feel sure that direct irradiation at high intensity will prove to be a rational and hopeful advance in the treatment of cancer of the stomach and other viscera. Whether the cancer is rendered inoperable by the poor general condition of the patient or by irremovable local spread, this method will often succeed where surgery alone must inevitably fail. Though wider exposure is needed than for surgery alone, with adequate precautions the whole procedure should not be so shock-producing as is wide surgical excision.

Exploratory operation is the only reliable way of deciding the correct form of treatment, and the hospital of the future will have a radiotherapy room adjoining the operating theatre to facilitate direct irradiation.

It is more reasonable to irradiate most what most needs irradiating—i.e., the tumour and field of local spread—and not the overlying skin or intervening vital tissues.

Biopsy may not be practicable in all cases, as it is not altogether devoid of risk when there is no obvious glandular spread. But even biopsy is not always reliable, depending as it does on choice of the right piece of tissue, and being vitiated in some cases by variations in cellular differentiation in different parts of a tumour. Being able to see and feel the tumour should make the diagnosis more certain than when relying on external methods of examination alone, and biopsy will often increase that certainty.

Of course a method involving such extensive surgical procedures and such intensive irradiation must inevitably present new problems. Owing to difficulty in obtaining a sufficient number of suitable cases we have scarcely advanced beyond the "growing-pains." There are many modifications and improvements in technique we would like to try out. We hope that we have shown that our method is a reasonable and practicable possibility, and that eventually we may be able to improve on the present appallingly low cure rate of gastric cancer.

Unless and until we can achieve earlier diagnosis and bring a far greater number of operable cases to the gastric surgeon, there will remain a vast number of victims of this dreadful disease destined to die without even the hope of palliation or amelioration of their sufferings. Much more must be done for these patients, who greatly exceed numerically the relative few with operable lesions under the present conditions of diagnosis. Only too often our attitude is one of defeatism and despair towards these people, whose needs are often desperate. Even limited palliation for relatively large numbers might well balance the success achieved by spectacular and dangerous operations only possible for relatively few (Livingston and Pack, 1941).

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FIELD INVESTIGATION OF AN OUTBREAK OF DIPHTHERIA

BY

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AND

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An outbreak of diphtheria limited to one house occurred at a boys' boarding-school. The history of the outbreak and the tracing of the source of infection may be of interest. The house contained 39 boys, a matron and her daughter (Mrs. T. and A.T), a house-master, his wife, and four children. The domestic staff consisted of five persons for the boys and three for the family. The population at risk therefore comprised 55 persons, consisting of 11 adults, 40 adolescents, and 4 young children. The house was roughly divided into a private side and a school side, but two of the private-side maids, Y.S. and M.R., waited at table on the boys and family. These maids occupied a bedroom opposite to A.T., the matron's daughter.

History of the Outbreak

A.T. attended a day school in London. During the half-term holiday the head mistress received a notification that a girl who had last attended school on Oct. 31 had developed diphtheria on Nov. 3. There was no direct contact between this girl and A.T., but on Nov. 12 A.T. developed diphtheria and was removed to the Isolation Hospital. This date occurred during the half-term holiday of the boys' boarding-school. All direct contacts were swabbed and found negative, but in spite of the negative swab Mrs. T. was isolated in her room for eight days as a near contact. The boys returned from the half-term holiday, spent at their homes, and as some of them had been in contact with A.T. previous to going away they were all swabbed. Five of the boys were found to be immune carriers of gravis type, so they were isolated at the school sanatorium. On Nov. 21, nine days later, one of the boys, the house-master's child, and the nursery governess all developed diphtheria. A child in the neighbouring town was also notified on Nov. 28, and two further cases occurred among the boys on Nov. 30.

Frequent throat and nose swabbing of all contacts of the cases was now carried out, and on Dec. 8 the matron and the butler were found to have positive throat swabs, and on these findings were admitted into the Isolation Hospital as carriers. As no K.L.B. were discovered at the Isolation Hospital after swabbing their throat and nose three times on alternate days, they were discharged on Dec. 14. On the 16th, however, the matron and butler were readmitted as they had again become positive. These two people were apparently transient carriers, as no positive organisms were detected on re-examination at the hospital.

The child in the town who developed diphtheria had been visited by one of the maids, Y.S., who was therefore subjected to repeated swabbing of the nose and throat, but every swab was negative. Subsequent inquiry, however, revealed the information that she had been suffering from sores on the scalp and limbs, which had been treated with a fair measure of success by the matron.

On Dec. 22 school holidays started. During the holiday Mrs. T., A.T. (now discharged from hospital), and the butler all had throat and nose swabs taken by their private doctors and were found negative. On Jan. 19, 1947, a few days before the school reassembled, the occupants of the private side returned to prepare the house. As an extra precaution they were swabbed again, and the matron and her daughter were found positive. They left the premises on Jan. 20, before the boys returned, and did not come back until March 1. On Feb. 12 a laundryman delivered a basket of clothes at the house and is said to have held a short conversation with one of the maids, M.R. This man developed diphtheria on Feb. 16, twenty-eight days after the suspected carriers had left the house, and he suffered from a severe post-diphtheria paralysis. On Feb. 28 the night porter employed at the house also developed the disease and subsequently died of it. On March 1 the two maids, Y.S. and M.R., left the house and went to Hitchin. Before they left they had been in contact with a new nursery governess, who arrived on Feb. 22. On March 17 this governess developed diphtheria.

Summarizing the results of the outbreak: in a community of 57 persons (55 originally and 2 newcomers) there were 11 cases of diphtheria, with one death, one case of post-diphtheria paralysis, and nine immune carriers. The outbreak continued in spite of the absence of the suspected carriers—the matron and her daughter.

Continued Search for the Carrier

As the last three cases occurred after Mrs. T. and A.T. had left, suspicion fell on the butler, and on re-examining him a single colony of K.L.B. gravis was grown from the swabs taken on March 24, 26, and 27. Before the reports were received he also had left the neighbourhood, and could not be traced until April 9, when three concurrent swabs were negative. It was felt that his low infectivity was not a sufficient explanation of the continuance of the disease, although possibly he was responsible for the case occurring on March 17. It was therefore decided to follow up the two housemaids who had gone to Hitchin. Owing to the extraordinary sequence of events at the school the M.O.H. of Hitchin, co-author of this paper, had been informed of the arrival of Y.S. and M.R. at an inn in his district, and the following events occurred.

March 3.—Arrival of M.R. and Y.S. at the inn.

March 10.—A contact at the inn, S.B., developed a sore throat and was off work for a week.

March 12.—An out-worker at the inn developed diphtheria.

March 21.—A guest staying at the inn left for Brighton and was admitted into Brighton Isolation Hospital with diphtheria on March 24.

March 24.—V.B., S.B., Y.S., and M.R. attended a local dance.

March 28.—V.B. was admitted to hospital with diphtheria. Throat and nose swabs from Y.S. and M.R. were returned negative, but these two girls were admitted to the Isolation Hospital for further observation.

March 31.—A swab of S.B. was found positive and she was admitted to hospital for diphtheria. M.R. and Y.S. were discovered to have verminous heads, and in addition M.R. had scalp sores and an eczematous ear. (It is to be noted that whenever she had previously appeared for examination she had worn a head-scarf.)

April 2.—Swabs taken from M.R.'s external auditory meatus and scalp sores were all found to contain K.L.B., gravis type and virulent. Y.S. was negative.

April 4.—Y.S. was discharged and left for her home. The M.O.H. was informed of her contact with a carrier.

Possible Course of the Infection

There are three possible originators of this outbreak. In the first place, the girl at A.T.'s London school may have infected A.T. and through her the sores of the housemaids may have become contaminated with K.L.B. We think this is unlikely: twelve days is a long incubation period for diphtheria, and there is no evidence that the first girl already had the disease on the last day she attended school (Oct. 31), three days before her case was diagnosed. A.T. was isolated immediately diphtheria was suspected, and did not come into close contact with the maids before she was removed to hospital. Y.S. is the second possibility; and the chief point in suspecting her as the originator of the outbreak is that she was the only connecting-link between the school and the town and actually visited the house where the town case occurred. In addition, the matron dressed her sores, and she was in close contact with the butler, thus explaining the transient nature of the swabs taken from these two sources. She

waited on the boys at table, and the dates on which the cases fell among the boys are more suggestive of contact infection from one source than of infection from case to case. The last point applies equally well to M.R., and in addition she undoubtedly infected the laundryman. She did not, however, visit the child in the town. The Medical Officer of Health reports that by the time she was admitted into the Isolation Hospital at Hitchin her head was a mass of foul-smelling offensive sores, while Y.S. was comparatively clean. Taking the available evidence as a whole, we think M.R. was the originator and that she infected Y.S., whose skin was already in an unhealthy state. Y.S. took the infection to the town, but, possibly owing to the ministrations of the matron, by the time she reached Hitchin her sores were healing, and the infection was then carried on by M.R.

Steps Taken to Prevent Spread.—These were: (1) Careful and repeated swabbing of all members of the infected house and isolation of immune carriers; (2) isolation of the boys from the infected house; (3) protective injections (2,000 units of anti-diphtheria serum) and re-immunization of the boys and the domestic staff; (4) re-immunization of the rest of the school with 0.3 ml. A.P.T.

Points of Interest

(*a*) The comparatively small number of cases and carriers in a closed community.—This is no doubt due to the relatively large proportion of protected persons within the community at risk. All the boys except two had had their primary immunization before joining the school. Of the two who had not, one contracted the disease. The other three boys who had the disease had been immunized in 1939, 1941, and 1940 respectively, thus suggesting that the protective power had lessened after five years and that a "boosting" dose was required. Nevertheless, it is reasonable to suppose that the primary immunization of these three boys had helped in combating the disease, as the two adult cases (the laundryman and porter) who had not been immunized were more severely infected. The immediate steps taken to heighten immunity in those not attacked were also effective.

(*b*) The difficulty of determining the significant carrier.—Much time was lost and two serious cases received their infection through the assumption that Mrs. T. and A.T. were the significant carriers. It was only an obstinate refusal to discard the school–town infection clue, even after negative swabs, that led to the M.O.H. at Hitchin being put on his guard and to the detection of the actual infectors.

(*c*) That a number of cases of pharyngeal diphtheria occurred from a skin infection of virulent gravis diphtheria.—Although not unknown, this is an unusual occurrence and should lead to a careful scrutiny for skin lesions in an unexplained prolongation of an outbreak.

The spring number of the *American OSE Review* is particularly interesting for a number of articles by Jewish doctors on their experiences in the ghettos and concentration camps established by the Germans. Dr. E. Herman gives an account of a typhus epidemic in 1941–2 in the Warsaw ghetto, where over half a million people were crowded together. "Liquidation" of the ghetto followed in 1943, being "preceded by a tour of S.S. men and Gestapo with monocles in their eyes in shiny limousines." There were about 80,000 cases in the epidemic; he tabulates the neurological syndromes found. Conditions in the Vilna ghetto were little less deplorable, and Dr. Dworzecki mentions that about 75% of the women ceased to menstruate for a varying period of time soon after being herded into it. The camp commandant ordered several women with severe scabies to be shot. Dr. Rosenblum briefly describes the destruction of the Jewish community in Warsaw by shooting, gas, and burning, and the plight of children left to wander in the ruins and forests.

PARTIAL HEPATECTOMY AND RIGHT HEMICOLECTOMY FOR CARCINOMA OF THE HEPATIC FLEXURE

BY

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The object of this paper is to call attention to the feasibility of carrying out an operation for the removal of a carcinoma of the hepatic flexure of the colon which involves the right lobe of the liver by direct extension. Coincidental partial hepatectomy at the time of gastric resection for carcinoma involving the liver by direct extension from the stomach has been performed by Wangensteen (1943, 1945). It is of interest also to remember that in 1923 Grey Turner stated: "Direct extension of malignant disease from the stomach or colon may render removal of a portion of the liver necessary, and I think this will become one of the most frequent indications, especially as it usually only involves the removal of a slice or wedge from the edge of the organ. In cases of this kind such an extension to the liver need not in itself be a bar to successful operation if the extension of the growth in other directions rendered its removal profitable." Some six years ago I performed a right hemicolectomy for a carcinoma of the hepatic flexure which invaded the right lobe of the liver, and it was necessary to remove a slice of liver with the growth; this patient remains well without recurrence at the present time, proving that the end-result of such an operation is most satisfactory. Recently, however, a much more formidable problem presented itself, and it was necessary to remove a large portion of the right lobe of the liver, including the gall-bladder, for a massive carcinoma involving the liver and hepatic flexure of the colon. Two months previously a surgeon who performed an ileo-transverse-colostomy as a palliative measure considered this growth to be inoperable on account of the extension to the liver. The clinical details concerning this patient are embodied in the case record given below. Since an operation for resection of a large lesion of the right lobe of the liver is a rare surgical procedure the technical details are described.

Case Record

A man aged 38 developed pain in the right lower abdomen when in India a year ago. It was sharp in character and was accompanied by diarrhoea. This attack subsided and he was able to continue his work. Several weeks later the diarrhoea recurred with four stools a day. He still experienced pain in the right lower abdomen. His appetite was good and he felt fairly well. Seven months ago the abdominal pain became continuous; he lost his appetite, and noticed that the bowels had become constipated. He gradually lost strength, and on examination a lump was found in the right iliac fossa. Three months before we saw him he reached this country and was admitted to another hospital. A hard mass was noted in the right hypochondrium, blood was present in the stools, and *Entamoeba histolytica* was demonstrated. An *x*-ray examination after a barium enema showed a large filling defect in the transverse colon. He was given a course of emetine therapy to exclude an amoeboma, but this treatment had no appreciable effect. An exploratory laparotomy was then performed after preliminary blood transfusion, and the mass appeared to be a large scirrhous carcinoma of the transverse colon just medial to the hepatic flexure and invading the gall-bladder and liver, to which it was densely adherent, but no secondary deposits were found. The growth was considered to be inoperable and an

ileo-transverse-colostomy was performed. The patient made a good recovery from the operation, the colicky abdominal pain subsided, the stools were normal, and his appetite improved.

Later his condition began to deteriorate, with the development of severe secondary anaemia, and in spite of three blood transfusions of 1 pint (568 ml.) each, the red blood corpuscles fell to 2,400,000 per c.mm. and the haemoglobin to 35%. There was severe pain in the region of the tumour and he was transferred to the Royal Cancer Hospital. On examination the patient looked ill and pale, and had obviously lost much weight. There was a large mass in the right half of the abdomen extending from the right hypochondrium to the upper limit of the right iliac fossa; it was extremely tender and appeared somewhat fixed. Sigmoidoscopy revealed no abnormality; a smear from the bowel showed no cysts or amoebae. There was marked secondary anaemia; red blood corpuscles numbered 1,900,000 per c.mm., and the haemoglobin was 28%. The plasma proteins were normal; plasma ascorbic acid was subnormal. A fractional test meal showed no abnormality. Radiological examination of the colon after a barium enema revealed a large irregular filling defect at the hepatic flexure extending 2 in. (5 cm.) into the transverse colon and 4 in. (10 cm.) into the caecum. This had the appearance of a carcinoma. The patient was given three blood transfusions of 3 pints (1.7 litres), 1½ pints (0.85 litres), and 5 pints (2.84 litres). The last massive transfusion was given because of a rapid deterioration in his general condition, probably due to haemorrhage occurring from the growth into the colon. It was decided—and the patient and his wife wished it—to perform an exploratory laparotomy to determine whether the mass could be removed. This operation was performed on Feb. 12, 1947, and a large mass was found involving the hepatic flexure of the colon and the right lobe of the liver. No metastases were found elsewhere in the liver or in the rest of the abdomen, and the ileo-transverse-colostomy was perfectly satisfactory. It was decided to perform a right partial hepatectomy and right hemicolectomy. The patient has made a good recovery. Microscopical examination of the tumour showed a highly cellular adenocarcinoma.

Technique of Partial Hepatectomy

After visual inspection and careful palpation of the right lobe of the liver the line of section is determined so that the excision is performed through normal tissue wide of the growth. The right lateral ligament of the liver is divided and the organ is delivered as far as possible into the wound by manual traction. The incision begins on the lateral aspect of the right lobe and the diathermy knife is used. It is essential to divide small areas of the liver at a time so that haemorrhage is completely controlled. This is effected by digital pressure on the liver tissue with gauze and by the insertion of mattress sutures of catgut, using special liver needles. It is pointed out that owing to the thickness of the right lobe of the liver it is impossible to insert through-and-through sutures from the antero-superior to the postero-inferior surfaces, and each suture therefore takes in about half the thickness of the organ. When the middle of the lobe is reached an incision is begun on the antero-internal aspect, passing posteriorly to the gall-bladder. The intrahepatic branches of the right hepatic artery are secured by the application of pressure forceps and are ligated. It is useless to employ pressure forceps to control haemorrhage from hepatic tissue apart from these well-defined vessels. This incision progresses to the middle of the lobe until it meets its fellow from the opposite side. The cystic duct and cystic artery are then ligated in continuity and divided, thus liberating the excised portion of the right hepatic lobe. The raw area of the liver is inspected, and bleeding points are touched with the diathermy coagulating knife; thus all haemorrhage is controlled. This area is covered with several layers of gauze, which are removed at the end of forty-eight hours. Alternatively it can be shut off by means of the great omentum, but it is necessary to drain the area because of the leakage of bile for several days in the post-operative phase. It is possible that the use of fibrin foam may in future prove of value in dealing with haemorrhage from the cut surface of the liver.

Pre- and Post-operative Treatment

Before an operation of this magnitude is performed investigations are made as to the patient's general fitness, and any abnormalities are rectified whenever possible. Special attention is given to the cardiovascular, respiratory, and urinary systems. The blood is examined to determine the degree of secondary anaemia and whether there is protein deficiency. A severe degree of secondary anaemia will be present, and a number of pints of blood are required to bring the haemoglobin content up to a level of at least 70%. The blood ascorbic acid is estimated, and the patient is given this substance in doses of 100 mg. twice daily, together with thiamine and riboflavine in doses of 3 mg. thrice daily. A high-protein and high-carbohydrate diet is given, with plenty of fluid.

Blood transfusion is started during the operation, and this continues into the post-operative phase, the amount transfused depending on the patient's condition. Intravenous fluids are given for at least during the initial forty-eight hours until intestinal peristalsis returns, when the patient can begin to take small quantities of fluid by mouth. He requires a minimum of 3,000 ml. of fluid in twenty-four hours, composed of 400 ml. of plasma and the rest of glucose-saline. After partial hepatectomy the patient is apt to become dehydrated and to develop secondary anaemia; a blood transfusion may be required to rectify this condition. Casein hydrolysates are given in order to increase the protein intake, and in spite of the daily doses of ascorbic acid the blood values of this substance may be subnormal. The availability of superficial veins for transfusion purposes may become distinctly limited, and in this patient it was necessary to use the right external jugular vein, which was quite satisfactory. When the raw area of the liver is drained anteriorly through the right paramedian incision, and not through a stab incision in the right loin, it is advantageous to employ postural drainage by turning the patient into the ventral position for twenty minutes every two hours by day. Skilled nursing and meticulous attention to all details in the management of the patient are essential, and the rehabilitation programme must be carried out very gradually whenever the liver has been subjected to trauma. Jaundice may develop during convalescence in patients who have had wounds of the liver, and they must be kept under careful observation for a long time after discharge from hospital.

Summary

Attention is directed to the operation of partial hepatectomy combined with right hemicolectomy for carcinoma of the hepatic flexure of the colon infiltrating the right lobe of the liver. The technique of partial right hepatectomy is described and the pre- and post-operative management is given. The case history is cited of a patient for whom this operation was performed successfully, and another patient is cited who is alive some six years after resection of the anterior aspect of the right lobe of the liver combined with right hemicolectomy for carcinoma of the hepatic flexure of the colon.

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A circular from the Ministry of Health announces that the Food and Drugs (Milk and Dairies) Act, 1944, will not be brought into operation this year. The Act regulates dairy farms and farmers and the production of clean milk.

HERNIA OF THE DIAPHRAGM AS A COMPLICATION OF LABOUR

BY

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Diaphragmatic hernia in the parturient woman is probably not excessively rare. The lack of references to such cases in the medical literature therefore seems remarkable, especially as regards prognosis, of which I can find no mention. Even Browne's (1944) comprehensive book does not include this complication of pregnancy. A practitioner faced with a radiograph showing a large hernia through the diaphragm in a woman nearing term cannot be blamed if he feels somewhat apprehensive as regards labour, with the additional strain and pressure which will accompany the pains, and he may be tempted to perform a quite unnecessary caesarean section. I have had two cases of large diaphragmatic hernia and one of eventration of the diaphragm under my care during their confinements, and I feel that the publication of a brief note may prove helpful. These cases were seen before September, 1939, and the clinical notes are scanty and incomplete, as the original hospital case sheets cannot be traced.

Case Reports

Case 1.—This patient, aged 21, had had one previous confinement without complications. The weight of the child was not recorded. She was well till the thirty-sixth week, when dyspnoea on the slightest exertion and occasional vomiting started. A radiograph of the chest demonstrated a large diaphragmatic hernia on the right side, with the greater part of the stomach bulging into the thorax through the diaphragm. There was no obstetrical abnormality and the head was deeply engaged. It was decided to induce labour prematurely, and surgical induction by puncture of the membranes was performed at the thirty-eighth week. Pains started soon afterwards. Morphine, 1/6 gr. (11 mg.), hyoscine, 1/150 gr. (0.43 mg.), and paraldehyde, 6 dr. (21 ml.), in olive oil were given per rectum during the course of labour. A child weighing 6 lb. 4 oz. (2.9 kg.) was delivered naturally twenty-two hours after rupture of the membranes. Slight dyspnoea was evident at times during the second-stage pains, but was not severe enough to cause anxiety or require treatment. There was no cyanosis. Immediately after delivery vomiting was troublesome and continued for four days. Attacks recurred during the remainder of the puerperium unless meals were kept dry and small. Eventual recovery was satisfactory and further symptoms are not recorded. Surgical treatment for the hernia was not advised.

Case 2.—This patient, aged 36, had had two previous confinements, which according to her statement were uncomplicated. A radiograph of the chest was taken late in pregnancy after complaints of shortness of breath. This revealed a very large diaphragmatic hernia on the right side, reducing the thoracic space on that side to what appeared to be an alarming degree. The patient was admitted to hospital and put to rest, when labour started spontaneously. The first stage was quick and caused no abnormal symptoms. Second-stage pains, however, caused considerable distress, with dyspnoea, and at times slight cyanosis. Oxygen was administered during the pains throughout the second stage and gave great relief. There was some delay with the head on the perineum, and the patient was delivered easily by a low forceps operation under light chloroform, ether, and oxygen anaesthesia. Recovery was uneventful.

Case 3.—This patient, aged 25, had had one previous confinement which resulted in a stillborn child weighing 9 lb. (4.1 kg.) being delivered by forceps. During the present pregnancy she had attacks of epigastric pain and shortness of breath. Examination of the chest revealed dullness at the left base, with weak breath sounds and absence of vocal resonance. The apex beat was 1½ in. (3.8 cm.) to the left of the sternum. A left-sided pleural effusion was suspected, but a radiograph revealed a marked degree of eventration of the diaphragm, which was confirmed by screening. Labour started naturally at term and lasted five hours. There were no signs of distress during the second stage, and a child weighing 7 lb. 13 oz. (3.5 kg.) was delivered. Partial separation of the placenta and a moderate post-partum haemorrhage complicated the third stage. Eventual recovery was satisfactory.

Discussion

Diaphragmatic hernia is usually classified as congenital or acquired and true or false. A so-called false hernia has no sac. Eventration of the diaphragm and thoracic stomach, with a short oesophagus, may produce the same symptoms as a true hernia by diminishing the space available for lung expansion and oxygenation of the blood. Of the true hernia the congenital type is rare, and is stated by Richardson (1929) to occur more often on the left side. All authorities agree that the acquired type is nearly always found on the right side at the site of the oesophageal hiatus, and it is probable that Cases 1 and 2, described above, were of this variety. Such hernias are thought to be due to congenital weakness of the muscular ring of the oesophageal hiatus, allowing the sac to bulge into the right pleural cavity alongside this structure. It seems that small hernias of this description are not uncommon. Rigler and Eneboe (1935) were able to demonstrate forty-four cases of hernia in 4,200 radiological examinations, and they stated that the condition is commoner in the female in the ratio of 15 to 4. Harrington (1935) stated that routine examinations during laparotomy show that in 50% of persons no para-oesophageal opening can be felt, but in 50% two or three fingers are admitted. He regards an opening admitting up to two fingers as within normal limits. Increased intra-abdominal pressure seems undoubtedly a factor in producing or increasing the size of these hernias, and the stomach may slip in and out of the sac according to the degree of pressure and gastric tension. Ude and Rigler (1929) have observed such cases in women following multiple pregnancies, large ovarian cyst, large myoma, and ascites with malignancy. Rigler and Eneboe have also shown that small para-oesophageal hernias are by no means uncommon in late pregnancy. In 195 radiological examinations in the third trimester of pregnancy they demonstrated hernias in 12.8% —in 18.1% of the multiparas and 5.1% of the primiparas. In routine gastro-intestinal examinations they found such hernias in only 1%. Therefore it seems reasonable to presume that some degree of hiatus hernia is not uncommon in late pregnancy, especially in multiparas or in women in whom there has been a previous increase of intra-abdominal pressure from some other cause. The number of these hernias which reach proportions large enough to cause symptoms in late pregnancy or labour must be small, as it has already been pointed out that there is little mention of such cases in the medical literature. Large hernias which do not cause symptoms are, however, likely to go unrecorded unless discovered accidentally, as exact diagnosis is not possible without chest radiography. But if, as according to Rigler and Eneboe (1935), 12.8% of women have some degree of hernia in late pregnancy it seems likely that a small proportion of these may enlarge with repeated pregnancies; or, again, it is possible that any large hernia encountered is originally of congenital origin.

Symptoms.—The common symptoms caused by hernia through the diaphragm associated with pregnancy are

gastric upsets—that is, nausea or vomiting—and dyspnoea. If such symptoms occur they usually start late in pregnancy, after the thirty-fourth week. The three cases described all suffered from dyspnoea during late pregnancy, and in Cases 1 and 2 it caused some distress during the second stage of labour. In Case 1 there was vomiting in late pregnancy, which was especially aggravated after delivery and continued to be troublesome during the puerperium, probably owing to some alteration of the position and tension of the stomach after the uterus had emptied.

Treatment.—During late pregnancy the patient must rest more than usual, and if dyspnoea is not relieved should be confined to bed. Vomiting can usually be relieved by attention to the diet. Small and frequent meals of soft food or fluids may be necessary. Postural treatment may be useful, the patient herself usually finding out which position suits her best. Laxatives should be given to ensure regular bowel action. In cases with severe encroachment on the thoracic cavity induction of premature labour must be considered. A long second stage is not desirable, as the dyspnoea may increase with the pains and the patient become distressed. If, therefore, there is any reason from the history or clinical findings to suspect that labour may be prolonged, induction at the thirty-eighth week is probably the wisest course. A medical induction may be tried, and if this fails the membranes should be ruptured. If disproportion or other obstetrical complications are present caesarean section will of course have to be considered. During labour the usual sedatives should be given in the first stage. Oxygen may be necessary during the second stage and is essential if the patient becomes at all cyanosed. It should be given during the pains, and affords great relief. Low forceps delivery and episiotomy are indicated should there be the least delay on the perineum. Cyclopropane or local anaesthesia should be used.

In the puerperium careful dieting may be necessary if vomiting is troublesome as in Case 1. Vomiting usually ceases within a week as the stomach settles to its new position and gastric tension becomes adjusted.

The question of after-treatment of these large hernias cannot be fully considered here. In the majority of cases all symptoms disappear after delivery. Most authorities are of the opinion that surgical treatment is not indicated in cases of large hernia unless the sac is known to contain small gut and is therefore liable to strangulation. Morrison (see Richardson, 1929) believes that relatively few cases require operation. Treatment on medical lines should be continued if any symptoms persist.

Prognosis.—In all three cases described there was a severe degree of encroachment on the thoracic space—in two by true diaphragmatic hernia and in one by eventration of the diaphragm. The main object of this publication is to emphasize that labour may be allowed to proceed with safety under such conditions and that catastrophic effects do not occur. Whether the hernial hiatus is further enlarged as a result of labour is a matter for conjecture. Unfortunately these cases were not re-examined radiologically after the puerperium. Rigler and Eneboe, however, re-examined twenty-five cases after the puerperium in which small and moderate degrees of para-oesophageal hernia had been present in late pregnancy. They found that in only three of these cases could a hernia still be demonstrated radiologically. It seems, therefore, that though further stretching of the hiatus is probable during pregnancy and labour the hernia will retrogress as soon as the abdominal tumour is removed, and in many cases with only small and moderated degrees the condition will revert to normal. This conclusion is supported by the cessation of symptoms in nearly all cases after the puerperium.

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A NEW TREATMENT OF RHEUMATOID ARTHRITIS

BY

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It is always difficult to prove the value of a new therapy, especially when it concerns a disease which, like rheumatoid (atrophic) arthritis, to a great extent improves spontaneously, without any treatment. The *Primer on Arthritis*, issued by the Committee of the American Rheumatism Association in 1942, contains the following about rheumatoid arthritis: "Few accurate statistics on the natural course of the disease are available, but in general it may be said that fewer than one-fourth of the patients 'recover,' one-half 'improve' or the disease becomes 'quiescent,' and the remaining one-fourth become progressively worse. . . . It is particularly important that these facts should be born in mind when one is assessing the value of any therapeuti regimen."

According to literary data, the results of the gold, hetero protein, and vaccine therapies are almost the same—that i 65–75% are cured or improved and some 25–35% rema unchanged. If we compare these data with the statemen quoted above, we get the amazing fact that nearly as man recover without any treatment as with treatment. Th apparent paradox indicates that either all our therapi are worthless or statistics are unsuitable for assessin therapeutic effects.

Hitherto we have tested the value of a therapy by dete mining what percentage of a given number of cases we cured or improved. This is, however, a misleading pr cedure, because the number included those which healed improved spontaneously. We can assess the value of a ne treatment only by determining how many cases it cur or improved out of the "one-fourth" which did not impro either spontaneously or by the usual therapies. Shou such a case improve or recover—and especially if the i provement is quick and lasting—then we can be convinc that the change is not spontaneous but a result of the ne therapy. To an experienced physician it cannot be diffic to select from his patients the cases suitable for testing, a I am sure that in the cases reported below there is no dou about their belonging to this category. I thought it nec sary to raise these considerations of method before p posing a new treatment for rheumatoid arthritis.

A young woman suffering for three years from rheum toid arthritis became pregnant. In the third month of pregnancy she recovered unexpectedly, though until th her disease had seemed incurable. Later on I saw anot similar case: the patient twice became pregnant, and both instances her illness stopped; but after childbirth recurred. Similar cases have been observed by oth although naturally not in great numbers, because f women in such an invalid condition become pregn P. S. Hench (1938) collected from American medic literature the reports on the pregnancy of women suffer from rheumatoid arthritis. He found, from 1864 onwa

ten authors giving accounts of thirty-seven cases of pregnancy among twenty women. These twenty women improved to an astonishing extent during thirty-four of their pregnancies. The improvement, however, ceased some time after their delivery (9.4 months afterwards on an average).

The Method

I presumed as an explanation of this recurrence that pregnancy produces an unknown material which causes the improvement. Further, I assumed that this hypothetical material circulates in the blood of pregnant women and could be transfused and utilized elsewhere. On the basis of these conjectures I transfused the blood of pregnant women into persons suffering from rheumatoid arthritis. In each case I gave 300 ml. of citrated blood. I repeated this several times, according to the symptoms of improvement. To demonstrate my results—for the reasons outlined above—I did not choose the statistical method. Statistically, I got with this treatment the same result as with the other therapies—that is, of 28 cases 64% recovered or improved and 36% remained unchanged. But to meet what I said in the introduction to this account I selected those seemingly hopeless cases in which scientific treatment had so far yielded no result—cases, therefore, which undoubtedly belonged to the "one-fourth" who became "progressively worse."

I would call attention especially to two facts. First, the speed with which the improvement took place. Compared with the months or years needed to effect an improvement with gold therapy—which seems to be the most efficacious method at present—the improvement in our cases came with dramatic suddenness. Secondly, the lasting effects of the improvements. Patients Nos. 2, 3, and 6 remained healthy up to the time of writing (1946), and have not relapsed. They feel the changes in weather conditions, and during menstruation their joints are sometimes sensitive, but a real relapse has not occurred. Patient No. 4 committed suicide in 1944, for fear of the persecutions. Patient No. 1 was killed in 1944 by the Nazis. Until their deaths both had been free from symptoms.

Not all cases react equally well to these transfusions. We are discussing a disease of which the exact pathogenesis is unknown to us; we do not even know whether it is a homogeneous illness or a group of substantially different diseases showing only similar clinical features. So long as we are unable to differentiate the subspecies and determine in advance which case will improve by this method, we have to be satisfied with the fact that there are some cases of rheumatoid arthritis which can be promptly and permanently cured by the unknown material circulating in the blood of pregnant women.

Case Reports

Case 1.—A married woman aged 41 first had the disease in 1938, without fever, and within two months all her joints were affected. Mitral insufficiency was present. The sedimentation rate was 50 mm. Except for the hips, all joints were swollen and painful. Her moving and walking capacity was limited. The simplest actions—dressing, washing, getting up—could not be performed without help. The tonsils and dental abscesses were removed. No treatment brought any improvement. She was given 300 ml. of blood from a pregnant woman on Jan. 1, 1941. Chills and a temperature of 100.8° F. (38.2° C.) followed. Next day the improvement was surprising. She regained her power to move and the pains ceased almost completely. She got up, dressed, put on her shoes by herself—actions which she had been unable to do for months—and in her exhilaration began to knead bread, although the day before she had been unable even to button her dress. The improvement achieved on the first day was lasting, and slowly increased. Several transfusions were given during the following years. All improvements proved to be lasting. She was able to walk long distances, to work, and to run her house. During menstruation her joints were somewhat sensitive. Until her death in 1944 there was no relapse.

Case 2.—A 25-year-old woman first had arthritis in 1933. All her joints were progressively affected, and fever was present. In 1939 she had pneumonia and myocarditis. Before the transfusion she was for four months under hospital treatment for polyarthritis. Except for her hips, all her joints were affected and she was completely disabled. The sedimentation rate was 50 mm. The first transfusion of 300 ml. of blood from a pregnant woman was given on Feb. 17, 1941. Chills and a temperature of 103° F. (39.4° C.) followed, but next day there was improvement, especially in the joints of the upper limbs. The pains diminished substantially, and the joints became free. A little later the improvement reached the joints of the lower limbs, and she steadily improved. Several transfusions were given, but after the first she was completely healed, was free of pain, and was able to work.

Case 3.—A 32-year-old dressmaker had polyarthritis gravis. Her illness began in 1931, in her knees and wrists, with fever. During the next ten years the disease spread to all her joints, mostly with feverish attacks. Since 1939 the disease had grown rapidly worse. The feverish periods were more frequent and longer. In September, 1939, she had myocarditis. Since 1939 she had been in hospital five times and when I first saw her she had been in hospital for eight months. She was completely crippled, could not walk, move, or work. In the last months she could not even leave her bed. The sedimentation rate was 50 mm. On March 29, 1941, a transfusion of 300 ml. of blood from a pregnant woman was given and she felt better the same day. The improvement increased during the next days. The pains diminished, the joints became freer, and on the fifth day she walked round the ward for the first time in five months. We repeated the transfusion several times. The improvement continued. She is practically cured, and is able to earn her living again. Up to the time of writing (1946) she has had no relapse.

Case 4.—A man aged 66 had been ill for four years, with feverish attacks. Treatment had not helped him, and the polyarthritis progressed irresistibly. He suffered severe pain and was unable to get up or to turn over in bed by himself. His gait was very clumsy and his appearance was Parkinson-like. He had to be washed and dressed. For three months he had been under hospital treatment. The sedimentation rate was 58 mm. On April 9, 1941, a transfusion of 300 ml. of blood from a pregnant woman was given. The upper limbs became more active on the next day, his bearing straightened, and his gait was easier. His condition improved rapidly and progressively. He felt stronger and healthier in general, and left hospital substantially improved. I saw him two months later, when he was completely cured.

Case 5.—A woman aged 48 had had polyarthritis for ten years. Except for the hips and knees, which were painful, all her joints were swollen and their active or reflex movements limited. The sedimentation rate was 25 mm. A transfusion of 300 ml. of blood from a pregnant woman was given on June 2, 1941, and fever followed. The first signs of improvement were observed on the sixth day. She gradually improved, the pains decreased, the swellings were reduced, and movements and walking were better. The transfusion was repeated, and she left the hospital in a painless, active state.

Case 6.—A woman aged 29 had ischialgia in 1937. Polyarthritis began in April, 1940, and gradually affected all her joints, but there was no fever. When I first saw her all her joints were more or less affected, deformed, swollen, and painful. She could walk only with great difficulty and was unable to work. The sedimentation rate was 40 mm. On July 8, 1941, she received 300 ml. of blood from a pregnant woman. Improvement began on the sixth day. After several transfusions the pains ceased. She has some sensitiveness to weather, but can move and work. Up to the time of writing (1946) she has had no relapse.

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Medical Memoranda

Tuberculosis of the Adenoids

In 1945 fifteen cases of tuberculous cervical adenitis were treated at the country branch of the Hospital for Sick Children. Shortly after admission the tonsils and adenoids were removed and examined microscopically. The incidence of tuberculous infection of the tonsils was about 70%, as might be expected from a study of the literature, but it was surprising to find that in this short series three cases showed infection of the adenoids. They are recorded because tuberculosis of the adenoids is rarely mentioned. In 1924 Crowe and MacCready, in an analysis of the pathology of tonsils and adenoids removed at the Johns Hopkins Hospital, noted that tuberculous lesions were present in 2.5% of 1,000 cases of adenoidectomy. In these cases there was no clinical evidence of tuberculosis. No other record could be found of the incidence of tuberculosis of the adenoids in children. One case in an adult was described by Pegler in 1911.

CASE REPORTS

Case 1.—A male child aged 15 months was admitted to hospital on Aug. 10, 1945, with many enlarged glands in both sides of the neck and a discharging sinus in the left side. He had had cervical adenitis since the age of 3 months. His general condition was fairly good, and his weight and height were normal. The tonsils and adenoids were removed on Sept. 25, 1945. Section showed tubercles with giant cells in both tonsils and in the adenoids. At no time was there any clinical or *x*-ray evidence of tuberculosis of the chest or elsewhere.

Case 2.—A female child aged 11 months was admitted to hospital on April 18, 1945, with bilateral enlarged cervical glands and a fluctuant abscess below the left mandible. The glands had been enlarging for about a month, and although the child was a little underweight she was plump and looked fairly well. The abscess was immediately incised and expressed. There was a little further glandular enlargement and loss of weight during the next two to three weeks; then she began to improve, and on May 17 was fit for removal of the tonsils and adenoids. This was done, and a second abscess was expressed. Section showed tuberculosis of the adenoids but not of the tonsils. There was no clinical or *x*-ray evidence of tuberculosis elsewhere.

Case 3.—A male child aged 13 months was admitted to hospital for cervical adenitis in February, 1946. He had a discharging abscess on the right side; this was expressed and the tonsils and adenoids were removed on May 4, 1946. He looked well and was a little above the average weight for his age. Section showed evidence of tuberculosis of the right tonsil and of the adenoids. There was no clinical or *x*-ray evidence of tuberculosis elsewhere.

COMMENT

In each of these cases there was gross cervical adenitis in a child under 2 years of age, and the tuberculin patch test was positive. There was no evidence of tuberculosis of the chest or elsewhere, the weight was about the average or above the normal for the age, and the general health appeared to be good. Clinically there was very little enlargement of the tonsils and adenoids in the first two cases and no inflammation. In the third case there was some enlargement and inflammation of the tonsils during the early part of the illness. No information was obtained as to the origin of the infection in these cases. In none of them was the condition of the tonsils and adenoids such that their removal would have been advised on ordinary clinical grounds. It is probable that investigation of a larger series would reveal infection of these tissues to be more common than is generally supposed.

Treatment consisted in removal of the tonsils and adenoids, expression of glands in which abscess formation had occurred, and general care in the hospital's country branch. These cases are interesting in comparison with cases of streptococcal cervical adenitis. Here the child is pallid and debilitated, and often acutely ill with enlarged red tonsils and nasal obstruction. In the tuberculous infection many glands may be grossly enlarged, but the child is relatively well and the tonsils and adenoids are small and pale.

Macroscopically the tonsils and adenoids were small and of a soft, firm consistency. Sections showed giant-cell systems and areas of necrosis typical of tuberculosis. In these cases there was no difficulty in demonstrating the pathology in sections taken from any part of the tissue. No special technique was used.

Acknowledgment is due to Mr. Denis Browne, F.R.C.S., for permission to publish these cases, and to Drs. Richardson and Bodian for preparing the sections.

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Mental Disturbance as the Leading Symptom in Typhoid Fever

The following case of typhoid fever is worth recording because of the prominence of mental symptoms and the indefiniteness of the pyrexial illness in the early stages. It also illustrates the difficulty experienced during the war in interpreting symptoms of psychoses in the Middle East where toxic confusional states occurred far more often than at home. Pyrexia of unknown origin was common and was as likely to occur in a patient in a psychiatric hospital as elsewhere.

CASE REPORT

An Army chaplain aged 36 was admitted because of increasing mental disturbance over the past six days. He was by this time very restless and agitated, banging his head against the wall and crying out that all was lost. No contact could be made with him other than that he begged to be placed before a firing squad. He said voices were accusing him of having turned from God, and were threatening him with eternal torment such as his wife and child, supposedly in the next room, were suffering at the hands of the devil in being boiled in oil and yet unable to die. He had been pyrexial for several days, so a full investigation into this was made after examination by the medical specialist and under his guidance.

Clinically nothing whatsoever pointed positively to typhoid until the last few days of the illness. Blood investigations revealed nothing abnormal, with the exception that after two subcultures a growth of what was identified as *Bact. typhosum* was found. This identification was made on what was estimated as the thirteenth day of the pyrexia. In the meantime the patient's condition deteriorated rapidly, and he died the following day. A post-mortem examination showed typical typhoid changes throughout, though intestinal perforation had not occurred.

During the course of the illness the mental disorder had given considerable concern. The acute symptoms had been of gradual onset and at first appeared to be quite unconnected with any incidental pyrexia. The patient became depressed, stated that he did not feel well, and spent hours looking at family photographs. He had been under a psychiatrist for two months on account of emotional instability, undue activity, and vociferation about his work. He had admitted a previous depressive breakdown; but now he had become disorientated, and lived in a state of continual torment in what he considered to be gaol. He was intensely suicidal and had to be restrained. From the first he was resistive and uncooperative, and was continually whispering hoarsely that he was going through hell. He maintained that he had no physical illness. The same delusions of persecution persisted throughout, accompanied by extreme agitation, until he became comatose through exhaustion the day before he died.

COMMENT

Here the depressed form of acute confusional psychosis occurred in a febrile illness which proved to be a fatal case of toxaemic typhoid fever. Depression began at or just before the onset of pyrexia in a man of known cyclothymic constitution and progressed, with the development of acute suicidal tendencies, as the pyrexia continued, later being absorbed in a confusional setting of disorientation, imperception, and acute hallucinosis. The persistence of relatively fixed delusions suggested the precipitation of a depressive psychosis. This case illustrates the difficulty of diagnosing the depressed form of confusional psychosis and shows well the resemblance between this disorder and the depressive phase of manic-depressive psychosis, and occasionally the depressed form of katatonia.

I wish to thank Col. O. J. O'Hanlon, late R.A.M.C., for permission to describe this case.

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Reviews

WORCESTER ROYAL INFIRMARY

A History of the Worcester Royal Infirmary. By William Henry McMenemey, M.A. (Pp. 356; illustrated. 21s.) London: Press Alliances, Ltd. 1947.

This handsome book has evidently been a labour of love for its author, and we cordially congratulate him on the result. It is the history not only of a notable hospital but of many aspects of civic life in Worcester during the past two hundred years. The hospital is one of the oldest provincial voluntary hospitals, and it owes its birth mainly to the vigorous personality of Bishop Isaac Maddox, a distinguished churchman who, fortunately for Worcester, was also greatly interested in hospitals. He founded the London Smallpox Hospital and was a firm believer in the value of vaccination at a time when it was regarded with suspicion even in many medical quarters. Dr. McMenemey builds his story of the hospital mainly round a few attractive and forceful personalities. One of them, John Wall (1708–75), a surgeon to the hospital and a voluminous writer on medical subjects, founded the celebrated Royal Worcester Pottery as well as a large and prosperous family. (The fertility of the professional classes in the 18th and early 19th centuries was remarkable. Hastings was the sixth son of a parson, and families of a dozen or so are quite common in this history.) T. W. Walsh (never on the staff) left medicine to become "Stonehenge," one of the classical writers on sport, editor of the *Field*, and founder of the National Coursing and All England Lawn Tennis Clubs. Several members of the staff became Fellows of the Royal Society and had more than a local reputation.

The book has a special interest for members of the B.M.A., for the activities of its founder are conspicuous in the record, increasing our respect for the industry, diplomacy, and versatility of a remarkable man. Appointed apothecary (that is, house-surgeon) to the Infirmary at the age of 18, he left to become a distinguished student at Edinburgh, and returned to serve no less than 43 years as a surgeon. There were few activities in the city in which he did not play a leading part: he was an alderman, the founder of the Worcester Natural History Society, a foundation member of the British Association for the Advancement of Science, and last but not least the founder and for many years the most active member of the B.M.A. Dr. McMenemey amply justifies his statement that "he was destined to become the leading personality of his day in the profession of medicine and the most distinguished of Worcester's doctors."

We can confidently recommend this book to all interested in the early history of our Association and to all who can enjoy a spirited, well-written, and carefully documented account of the trials and triumphs of those who made the Worcester Royal Infirmary what it is. The book is well illustrated, and a word of praise is due to the publishers, who as a gesture to the Infirmary have charged their costs only.

ALFRED COX.

EARLY AMBULATION

Early Ambulation and Related Procedures in Surgical Management. By Daniel J. Leithauser, M.D., F.A.C.S. (Pp. 232; illustrated. $4.50.) Springfield: Charles C. Thomas. Oxford: Blackwell Scientific Publications, Ltd. 1946.

Dr. Leithauser writes in advocacy of early ambulation after operation. He points out that purgation and fluid deprivation in the pre-operative period, immobility immediately after the operation, and prolonged confinement to bed in the phase of convalescence are the causes of pulmonary and circulatory complications, bowel atony, muscle wasting, invalidism, and all those ills that go to make up what he terms the "laparatomy syndrome." All this had to be said, but it has been said before—often. The author's special contribution is that he gets patients to stand by the bedside as soon as they have recovered from the anaesthetic, and discharges them from hospital in a day or two. The author's background is difficult to assess. By his description of a hypothetical case treated on standard lines (pp. 34 and 35), and by the number of cases of parotitis he encountered, he seems to have been unfortunate in his early training and to neglect surgical progress in the rest of the world. Fig. 11, p. 84, shows a method of gastric suction that would prevent not merely ambulation but any movement, and make even respiration difficult. His attention was drawn to the benefits of early ambulation in 1938 by the rapid recovery of a patient who got out of bed a few hours after appendicectomy. He has practised the method since then, his experience consisting of 55% of appendicectomies and little major surgery. Those operated on for chronic appendicitis left hospital after an average stay of 1.9 days, and those operated on for acute after 2.19 days.

What is normal practice to-day, with which the claims of this book should be compared rather than with a hypothetical case? The patient is not purged, starved, or dehydrated before operation, but his deficiencies in blood, fluids, and nutrition are corrected, and he is taught breathing, leg, and abdominal exercises so that he can start these under supervision as soon as he recovers from the anaesthetic. He is encouraged to move as soon as he is conscious, and allowed to sit on the edge of his bed to empty his bladder and to walk to a commode when his bowels act. He is allowed to get across the room to a chair when he wishes to, and urged to do so after four days. He is kept in hospital till his wound is soundly healed—that is, from six to twenty days—but urged during that time to resume his normal activity. That first-day ambulation for everybody, instead of for those who wish it, is a better policy seems doubtful, and second-day discharge from hospital even more so.

If Dr. Leithauser's colleagues in his home town practise the kind of pre- and post-operative care he outlines in the first chapters, he has done them a signal service in writing this book. If any British surgeons still keep patients in bed for three weeks they ought to read it; they also ought to be shot. This is the work of an enthusiast who has seen the light and wants to tell the world. Good luck to him!

W. HENEAGE OGILVIE.

VITAMINS AND HORMONES

Vitamine, Hormone, Fermente. By Dr. med. Rudolf Abderhalden. (Pp. 250. Swiss francs 14.50.) Basle: Benno Schwabe and Co. 1946.

Chemistry of Vitamins and Hormones. By S. Rangaswami, Ph.D., and Prof. T. R. Seshadri, Ph.D. (Pp. 329. 7 rupees, 8 annas.) Waltair, South India: Andhra University. 1946.

Vitamins and hormones claim our attention and challenge our intellect for three main reasons: they regulate general or special manifestations of all forms of life; their existence and distribution are of great significance in theories about the origin and chemical evolution of living organisms; and they provide us with therapeutic agents of great potency and precision. The books now under review, representative perhaps of the Germany of yesterday and the India of to-morrow, are good examples of the eagerness with which current biochemical information is being collected, arranged, and reported. Dr. Rudolf Abderhalden's book is the third edition of a work originally published in Halle in 1943. It is explicitly designed to give the medical practitioner the acknowledged facts about the physiology of the vitamins, hormones, and enzymes, omitting all material that is purely theoretical or speculative. The book is carefully planned and arranged, as might be expected from the author, who bears the name of a family renowned in biochemistry. The treatment of the subject is almost lexicographic. The author devotes a section to each of the principal vitamins and hormones, setting out the properties, chemical constitution, methods of estimation, natural distribution, physiology, clinical applications, and medicinal sources. He summarizes everything pertinent in a lucid and tidy way, though the general reader, misled possibly by the easy exposition into thinking that biochemistry is a simple discipline, will soon be chastened by the structural formulae, one of which occupies half a page. Of interest are the lists of proprietary vitamin and hormone preparations available (presumably) in Germany during the war, and issued by the firms of Wander, I. G. Farben, and Merck. By contrast, the section on ferments is brief and sketchy, apart from a dozen pages devoted to the "Abwerproteinase" reaction, originally worked out by Emil Abderhalden and his colleagues. This is based on the theory that functional disturbance of an endocrine

tissue is associated with the release of the characteristic tissue proteins into the general circulation. These stimulate the liver, which responds by elaborating corresponding proteinases, which are excreted in the urine and may be used in the diagnosis of endocrine diseases. A similar type of urinary proteinase is claimed to occur when malignant growths are present, and may be of value in diagnosis.

The book by Dr. Rangaswami and Prof. Seshadri, both of Andhra University, is a conscientious review of the progress of vitamin and hormone chemistry during the past fifteen or twenty years. The authors take little for granted and illustrate all important chemical reactions by the appropriate structural formulae. The book abounds in flow-reaction diagrams, carefully drawn, clearly printed, and not crowded on the page. The text is written in a direct and simple style, and, while there is nothing unusual in the plan of presentation, an unusual amount of information has been collected. The book will be useful to the student of organic chemistry as well as to the biochemist. European and American readers may regret the omission of any tabulations of the vitamin content of the principal Indian foodstuffs, and such might provide an instructive appendix to a subsequent edition of this useful book.

W. R. FEARON.

POISONS IN FIRST AID

Poisons, Their Properties, Chemical Identification, Symptoms, and Emergency Treatments. By Vincent J. Brookes and Hubert N. Alyea. (Pp. 209. 16s. 6d.) New York: D. Van Nostrand Company, Inc. (250 Fourth Avenue).

The authors of this book, which is intended for the use of the police and those who practise first aid, are a sergeant of police and an associate professor of chemistry. They begin with an account of tests, symptoms, and treatment. Under the latter they discuss the use of emetics but intentionally omit mention of gastric lavage. The main section is a list of poisons arranged alphabetically with formulae, description, uses, tests, symptoms, and treatment. Each entry is intended to be complete, which involves repetition of such phrases as "Summon a physician," but this arrangement is useful for quick reference provided that the poison taken is suspected. The tests given are for application to the remains of the substance or to a first vomit; they are not intended for traces. A table briefly summarizes the information. The authors then devote a section to industrial hazards, also arranged alphabetically, which includes a table of the number of parts per million of volatile substances and dusts in the atmosphere permitted in New Jersey. The division into these sections hardly seems necessary, since each is in alphabetical order and there is a good index. Chapter 6 is on foods, plants, snakes, and spiders, and chapter 7 on special techniques such as artificial respiration and the administration of oxygen. The appendix includes a glossary and tables of reagents and weights and measures. The illustrations are excellent, though perhaps that of a poisonous snake is too lurid.

Some of the omissions seem strange to us, though differences in American practice may account for them—for instance, neither weed killer nor sheep dip is mentioned under "arsenic." The authors do not discuss salicylic acid and aspirin, nor do they refer to the use of calcium compounds such as chalk in the treatment for oxalic acid poisoning. However, on the whole they present the material appropriately to the readers for whom the book is intended. No medical man will find it useful as a textbook, but for rapid reference, especially by those in contact with industry, it is well arranged and comprehensive.

J. H. RYFFEL.

A Synopsis of Orthopaedic Surgery (London: H. K. Lewis; 15s.), by A. David Le Vay, M.S., F.R.C.S., summarizes the literature to help students, including postgraduates, to prepare for examinations. We need not therefore expect it to be "readable," and indeed it is sometimes irritating. Readers will find it more useful for learning the facts of orthopaedic pathology and diagnosis than for its account of treatment, where there is some lack in critical assessment of method—for example, in the description of the now generally discarded lateral bloody approach to the hip-joint. Nevertheless Mr. Le Vay's book will be useful to a student for revision if he already has a knowledge of the subject based upon clinical study, and it should stimulate him to search other sources. For this purpose it would be improved if each section included selected references to the modern literature.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Escape to Live. By Wing Commander Edward Howell, O.B.E., D.F.C. (Pp. 230. 8s. 6d.) London: Longmans, Green and Co 1947.

The commander of a fighter squadron describes the 1941 Middle East campaigns, his capture, and ultimate escape.

An Introduction to Gastro-Enterology. By James D. Lickley, M.D. (Pp. 143. 8s. 6d.) London: Simpkin Marshall (1941), Ltd 1947.

A manual for medical students and house-men on the diagnosis and treatment of disorders of the alimentary tract.

Atlas of Bacteriology. By R. Cranston Low, M.D., F.R.C.P.Ed., F.R.S.Ed., and T. C. Dodds, F.I.M.L.T., F.I.B.P., F.R.P.S. (168 plates. 32s. 6d.) Edinburgh: E. and S. Livingstone. 1947.

Coloured plates depicting cultures and photomicrographs of micro-organisms.

An Introduction to Dermatology. Formerly by Sir Norman Walker, F.R.C.P., and G. H. Percival, M.D., Ph.D., F.R.C.P.E., D.P.H. 11th ed. by G. H. Percival. (Pp. 349. 35s.) Edinburgh: E. and S. Livingstone. 1947.

This edition has been rewritten; includes many coloured plates.

Studies of the Renal Circulation. By Joseph Trueta, M.D., *et al.* From the Nuffield Institute for Medical Research, Oxford. (Pp. 187. 25s.) Oxford: Blackwell Scientific Publications. 1947.

Experimental investigations into the renal and intrarenal circulations.

A Guide to Anatomy. By E. D. Ewart. 6th ed. (Pp. 318. 25s.) London: H. K. Lewis. 1947.

An illustrated manual of anatomy intended for students of physiotherapy.

Le Vie dell'Errore Clinico. By Ettore Debenedetti. (Pp. 160 No price.) Turin: Edizioni Minerva Medica S.A. 1947.

A general account of errors in clinical diagnosis.

Medicine. By A. E. Clark-Kennedy, M.D., F.R.C.P. Vol. I. "The Patient and His Disease." (Pp. 383. 20s.) Edinburgh: E. and S. Livingstone. 1947.

The first volume of a work intended to correlate the facts of medicine rather than to instruct in its various methods.

Modern Dermatology and Syphilology. By S. W. Becker, M.D., and M. E. Obermayer, M.D. 2nd ed. (Pp. 1,017. £5 10s.) London: J. B. Lippincott Company. 1947.

Includes new material on vitamin therapy, penicillin, and tests for syphilis.

Conduction Anesthesia. Edited by J. L. Southworth, M.D., and R. A. Hingson, M.D. (Pp. 981. £5 10s.) London: J. B. Lippincott Company. 1946.

An account of local analgesia by means of nerve block, refrigeration, and local infiltration, as well as spinal analgesia.

Précis de Physiologie. By L.-C. Soula. (Pp. 1,085. 1,450 francs.) Paris: Masson et Cie. 1947.

A textbook of physiology.

Précis de Dermatologie. By A. Civatte. 5th ed. (Pp. 1,152 1,700 francs.) Paris: Masson et Cie. 1947.

An outline of dermatology for the student and practitioner.

Rheumatism. By Lord Horder. 5th ed. (Pp. 61. 2s. 6d.) London: H. K. Lewis. 1947.

Notes on the causes, incidence, and prevention of rheumatism, with a plan for national action.

Le Problème du Cancer et Son Evolution Recente. By Michael Mosinger. (Pp. 664. 1,000 francs.) Paris: Masson et Cie. 1946.

A study of the aetiology and pathology of neoplasms.

L'Hyperinsulinie. By Marcel Sendrail. (Pp. 247. 500 francs.) Paris: Masson et Cie. 1947.

A monograph on clinical and experimental hyperinsulinism.

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NEUROSIS AND INDUSTRY

No time could be more appropriate than the present for any contribution towards increasing the productivity of our available manpower. It is common to think that this task is one to be solved mainly by the creation of stimulants or incentives—the stick or the carrot—to higher levels of output, and that the most effective techniques for this purpose can be evolved by those experienced in industrial management. The contradictory views expressed in the correspondence columns of the Press in the last few months, however, have made it apparent that little scientific progress has been achieved in the task of finding those positive influences which might raise the level of output. On the other hand, it has become increasingly evident in recent years that a serious loss of productivity is due to the persistence of, and possibly an increase in, negative influences, or factors which prevent individuals from maintaining their normal rate of output—e.g., those which lead to absence from work.

During the war, when evidence from many sources indicated that neurotic illness was one of the common causes of absence from work, the Industrial Health Research Board sponsored a study on "the true incidence of neurosis among factory workers and of its effects on production, and for an appraisal of the factors predisposing to such illness." The report of the study,[1] which was carried out by Dr. Russell Fraser and collaborators, certainly answers the questions on the extent of neurosis and its effects on production; and even if, as is pointed out, the results cannot be applicable with certainty to a wider field and to peacetime conditions, the findings have a familiar ring in relation to the industrial scene to-day, and they are too important to be ignored.

Fraser's careful investigations covered a random sample of over 3,000 male and female workers from a population of 30,000 employed in thirteen light and medium engineering factories. The main results are that neurotic illness caused between a quarter and a third of all absence from work due to illness and that neurosis was responsible for the loss of 1.09% of the men's possible working days and of 2.4% of the women's—a loss equivalent to an annual absence of three working days by every man studied and of six days by every woman. The latter figures may not at first sight sound serious, but what is more disturbing is that 10% (9.1% of the men and 13% of the women) had suffered from definite and disabling neurotic illness, and a further 20% (19.2% of the men and 23% of the women) from minor forms of neurosis—e.g., psychosomatic illness, some abnormalities of personality which indicated reduced mental health—during the six months before examination. These figures are much more serious in their implications when it is borne in mind that the investigators only recorded illness leading to absence. The milder interferences cannot but have been there with quite unknown effects on output either by direct loss in work done or by indirect effects in inefficient work.

It is stated in the report that "it was not the purpose, nor the outcome, of this inquiry to show how neurotic illness can best be alleviated. It is, however, implicit in many of the findings that measures tantamount to good welfare and social work, both within and outside the factory, would be beneficial in alleviating and preventing neurosis, as would also, presumably, more extensive facilities for the medical treatment of neurotic illness than were available during the war." After the incidence of neurosis was determined a search was made for evidence of any association between the incidence of neurosis and the environment of the subjects—not that it was assumed that any particular environmental factor associated with more than average neurosis was a cause of this increase in neurosis, but rather that the demonstration of a significant association with any particular factor is informative from several points of view. The circumstances associated with more than the usual incidence of neurosis include many that would be expected—e.g., excessive hours of work, restricted social contacts, recreation, or leisure interests, work unsatisfying or requiring skill inappropriate to the worker's intelligence, monotonous work programmes, and certain types of work. Particularly noteworthy are the statements that most commonly the circumstances outside the factory which were associated with a high incidence of neurosis are "characterized by unsatisfactory human relationships. The more obviously unsatisfactory the human relationships the closer the association. . . . Further, since unsatisfactory human relationships outside the factory are associated with a high incidence of neurosis, it is probable that the nature of the human environment within the factory may influence the amount of neurosis." It is also of fundamental importance to note that in the factories studied neurosis was as frequent among those on the more skilled as among those on the less skilled jobs, and as frequent among those usually receiving the highest range of earnings as among those usually earning less. Further, it was almost as frequent among foremen as among workers. These latter findings suggest that the effects of neurosis on production may be far greater than can be reckoned by objective indices such as absence. It is obvious that the quality of human relations within the working group is very heavily affected by the quality of the leadership available, which in turn must be adversely affected by an appreciable incidence of neurosis shown to exist at least within the lower levels of management.

The outstanding implication of this important report is the urgent need for further research in this field. It was remarked earlier that the doctor could contribute to the present crisis by helping to keep absence from work at a

[1] Russell Fraser, *The Incidence of Neurosis Among Factory Workers*. M.R.C. Indust. Hlth. Res. Board Report No. 90, 1947. H.M.S.O. Price 1s. 3d. net.

low rate. An implication of this report is in fact that the investigation of the "negative" factors such as ill-health and, in particular, neurosis may easily throw far more light than more frontal attacks on the deeper influences that make for effective co-operation and output in work, and on the effect of satisfactions in work on general well-being. The macroscopic study, such as Fraser's is, must be followed by microscopic studies into the nature of the psychological forces inside working groups and how these can be made as free from stress as possible. As Fraser himself mentions, the kind of association between neurosis and environmental influences which he gives is to be taken as suggestive rather than as a basis for treatment. Research into the treatment of the forces that affect human relations inside and outside the factory will not be easy. These forces are not only difficult to come to grips with, but inevitably they evoke the resistances that the investigation of social and cultural patterns arouse. They tend to be confused by political and other clichés—we recall the phrase "Cooper's Snoopers"—and investigators must have a capacity to carry a scientific attitude into complex situations which are often avoided by the scientist because of their complexity and the high emotional pressures on all involved in them. The doctor with experience of industry and an understanding of human relations can make a great contribution to these problems, the resolution of which is of such vital importance for the future of the nation.

There is perhaps a lesson to be carried into such research from the investigation of the psychological forces within the individual. The enormous advances in psychological understanding which Freud made were related by him to the fact that the "psychological patient" will make significant revelations only when the "investigator" is simultaneously a "therapist"; the unburdening of emotional problems is too painful and too risky unless some help in dealing with them is forthcoming at the same time. The "investigator" of the social group may therefore have to learn first how to become a therapist for progress to be made beyond superficial diagnosis.

The report carries important implications for the work of industrial medicine. With proof that neurosis is one of the commonest causes of absence from work, the industrial medical officer, if he is to play his part adequately, must be equipped with psychiatric knowledge. In proportion as he acquires this, the more will he contribute effectively to the well-being of the worker. Indeed it would be hard to set limits then to the importance of his contribution, for it is unlikely that the individual can be helped to gain more satisfaction in work without his carrying the effects of this experience into his whole way of life.

We may end by asking the question whether human relationships can be other than troubled in a society that lives under a continued sense of strain—as this country has lived since 1939. The modern State in the complicated modern world becomes increasingly paternalistic. Renewed threats to the stability of the State are met by increasing legislation of a restrictive character. Hemmed in by Statute, Order, and Regulation, the individual has little choice to order his own way of life, and often enough succumbs to the twin evils of apathy and frustration. Since the end of the war politicians have shown a growing reluctance to trust the individual, who in the present vast and imposing machine of the State is made to feel little more than a cog. He becomes a "calorie-consuming unit," a "man-hour producing mechanism." This must be a concern of the doctor who cares for the individual, and in particular of the psychiatrist grappling with the problems raised by the present report. There is something singularly uninspiring about the goal of the assembly line. The medical man, by forcing the politician to take count of the emotional needs of the ordinary man and woman, may yet bring home to him the force of the phrase used by Mr. Attlee last week, "We need to have vision also. . . ."

ALIEN DOCTORS

The future of the alien doctor granted temporary registration as a wartime expedient was referred to in the Annual Report of the Council of the British Medical Association.[1] In recent months some of our correspondents have contrasted their welcome in wartime with their present position. "It is a very good feeling to be recognized as an ally; and it is a very bitter feeling to be degraded again to an alien and a foreigner."[2]

The war brought to this country doctors from all parts of the world who could not be admitted to the *Medical Register* on the strength of the qualifications obtained in their own countries. Under the Medical Act, 1886, the registration of persons holding foreign qualifications is conditional upon the existence of reciprocal arrangements. This applies also to practitioners holding the degrees of British territories outside the United Kingdom, and while there are reciprocal arrangements with many such territories there are none with foreign countries. Those with Italy and Japan were terminated in 1940 and 1942. It became evident early in the war that all our medical manpower would be needed and that it would be foolish not to avail ourselves of the services of alien doctors resident here. The law was therefore temporarily amended by Defence Regulation 32B, which empowered the General Medical Council to grant temporary registration to doctors qualified abroad who served in H.M. or the Allied Forces or who undertook certain specified kinds of medical employment. When the war ended these temporary arrangements were reviewed, and the Emergency Laws (Transitional Provisions) Act, 1946, laid it down that while doctors already temporarily registered should so continue until Dec. 31, 1947, no further admissions should be allowed after February, 1946. The embargo on further registrations was lifted, however, in the Polish Resettlement Act, 1947, to allow temporary registration to Polish doctors coming to this country under the Government's Scheme.

The Government has had to consider what is to happen to these temporarily registered doctors next December, and has decided that those who have rendered useful service to this country and desire to remain here should be enabled

[1] *British Medical Journal Supplement*, 1947, 1, 62.
[2] Ibid., 1947, 1, 153.

to practise their profession. Many of the practitioners are elderly, and it is considered unreasonable to require them to study for British qualifications. To leave them no choice but to return to their own countries against their will, or to earn their living in some other occupation, would be neither just nor humane. It is proposed, therefore, in the Medical Practitioners and Pharmacists Bill, which was formally given a first reading in the House of Commons on Aug. 4, to empower the General Medical Council to grant such doctors permanent registration. This Bill would also make possible the permanent registration of alien doctors now in this country who have served overseas with H.M. Forces and had no occasion to seek registration before the temporary arrangements ceased. The number of alien doctors temporarily registered in February, 1946, is not known precisely, but according to the Ministry of Health 2,000 "is probably a liberal estimate."

There will be other alien doctors not falling within the categories already mentioned whose presence here is due to the war. Clause 4 is designed to meet their problems. Among them are doctors who throughout the war were ineligible for temporary registration because the work they undertook, perhaps research work, was not of a kind covered by the Temporary Registration Orders. Others will be Poles graduating at the Polish School of Medicine, Edinburgh, during the short time for which the School is expected to remain in existence. The doctors benefiting by this clause will be practitioners about whose work in ordinary medical practice nothing is yet known. In their case a period of provisional registration is proposed, subject to later confirmation.

The substantial benefit of permanent admission to the British *Medical Register* is not to be accorded without evidence of character, education, and satisfactory service; and—again according to the Ministry—"there should be no lowering of the standards which the General Medical Council seek to maintain." This is essential. The main provisions of the Bill are in accordance with recommendations made to the Home Secretary by the Central Medical War Committee with the concurrence of a number of professional bodies, including the British Medical Association. Clause 4, however, goes beyond these recommendations by extending the provisions of the Bill to cover any foreign doctor who has been allowed to enter the United Kingdom "in view of circumstances attributable to war." For example, a doctor who came here for non-medical employment as a European Volunteer Worker might apply for medical registration under Clause 4. "Circumstances attributable to war" would presumably cover any alien holding a foreign diploma who contrived to enter this country. Permanent registration for alien doctors who are proved allies and have given valuable service during the war will probably be accepted by most British medical men as no more than just. But opening a carefully guarded door as widely as Clause 4 would appear to do is a more debatable proposition. The B.M.A. and other professional bodies will have some months in which to consider the Bill before its second reading, and it is clear that the wording of Clause 4 requires careful scrutiny. Above all, no alien doctor should be admitted to the *Register* until he can satisfy the authorities that his training has been such as to guarantee competence in the practice of medicine. In cases of doubt an *ad hoc* examination might well be considered. Such an examination could, for example, be held under the auspices of the three Royal Colleges.

HYSTERIA SIMULATING POLIOMYELITIS

Throughout history certain diseases have caused widespread panic among the population exposed to infection. Sometimes this emotional reaction is justified, as with plague and typhus; sometimes the apprehension arises from the physical damage or apparently incurable nature of the disease in spite of low infectivity or low morbidity and mortality rates. In biblical times leprosy, although of very low infectivity, caused such panic. To-day poliomyelitis is arousing widespread anxiety among the public out of proportion to the low morbidity and mortality rates among those infected. In view of this, and of the deep sympathy aroused by the picture of paralysed youth, it would not be surprising if psychoneuroses, especially hysteria, produced imitations of the condition.

R. H. Young[1] reports five such cases in Nebraska during the outbreaks in neighbouring States in the late summer of 1946. There had been 176 cases in Nebraska during the year, 34 occurring in the third week in August; prominent reports in the Press had caused considerable apprehension. During that week Young observed five cases presenting a superficial resemblance to poliomyelitis, four of them showing weakness of one or more limbs. These proved to be psychoneurotic manifestations associated with minor upper respiratory infections. Three patients had relatives who had developed poliomyelitis and two had bad psychoneurotic histories. Young reconstructs a composite picture of these cases: a social attitude of marked anxiety precipitated by the development of poliomyelitis in the community and increased by infection in the family group; the occurrence of an upper respiratory infection with superimposed somatic symptoms of anxiety—neck stiffness, tightness in the throat, and weakness; and, finally, localization of the weakness in one or more extremities as a conversion symptom.

The diagnosis of non-paralytic and early cases of poliomyelitis is not easy. Young's cases were differentiated by (1) the diffuse nature of the weakness with normal or increased muscle tone and reflexes (the deep reflexes may show a transient increase in the early stage of poliomyelitis); (2) bizarre sensory changes not corresponding to any anatomical distribution; (3) a normal cerebrospinal fluid; (4) neurotic features in the present and past histories. Fortunately the hysteric seldom produces a consistent clinical picture, though careful observation may be necessary to detect the inconsistencies.

Young successfully relieved his patients by reassurance and explanation. Many psychoneurotics will be more resistant, and he states that the depth of psychotherapy needed depends on the "dynamics" of the individual case. Finally he stresses the importance of prevention. In his experience unwise publicity in the lay Press was a major factor in exciting the public, and he advises a strictly factual presentation in a part of the paper other than the front page. He also suggests that a special effort be made to appease unreasonable fears among the families and contacts of known cases. We might add to his recommendations education of the public as to the true extent of the dangers of poliomyelitis, perhaps by a comparison

[1] *New Engl. J. Med.*, 1947, **236**, 794.

with the infectivity, morbidity, and mortality of familiar diseases such as measles and whooping-cough.

NEW POLIOMYELITIS MEASURES

The importance of early diagnosis in cases of acute poliomyelitis and polio-encephalitis has been repeatedly stressed and is obvious. With no more than some hundreds of cases in this country in each year since 1938 few doctors have had the opportunity of seeing cases at the early pre-paralytic stage. To make good this fortunate lack of experience the Ministry of Health has taken the initiative and sponsored the shooting, which began this week, of a short film on the early diagnosis of poliomyelitis. It is hoped that the film will be shown to medical audiences about a fortnight hence. The British Medical Association has agreed to assist the Central Office of Information in distributing copies of the film and in arranging for it to be shown to doctors. The Secretaries of Divisions or Branches who would like the film to be seen in their areas should communicate directly with the Secretary of the B.M.A. Projectors and operators can be made available by the regional offices of the C.O.I.

On the question of treatment there have been two interesting developments in the London area this week. Consultations have been held between representatives of the L.C.C. and the London teaching hospitals. During the week ending Aug. 9, 106 cases were admitted to hospitals in the L.C.C. area, as against 55 in the previous week. The London teaching hospitals have now agreed to set up as soon as possible special units for the treatment of cases of poliomyelitis in the acute stage. The beds set aside for this purpose will be allocated through the Emergency Bed Service (Telephone Clerkenwell 6571).

The Emergency Bed Service has also agreed, during the present emergency, to extend its services in connexion with the distribution of mechanical respirators outside the immediate London area. No matter how early the diagnosis is made, a proportion of these cases will require treatment by means of mechanical respirators. The E.B.S. has a record of the location of all the "iron lungs" available in and around the London area and is prepared to arrange for these respirators to be moved promptly from hospitals where they are not in use to hospitals which need them.

LIMITS OF CERTIFICATION

The doctor's first duty is to his patient. In these days it seems necessary to repeat this truism over and over again because there are so many forces at work trying to upset this traditional duty of the medical man who treats the individual. The filling in of certificates has become an occupational disease in the medical profession, and in our issue of Aug. 2 (p. 187) Dr. Desmond Curran drew attention to an unfortunate example of this minor medical malady. In the same issue we recorded the view put to the A.R.M. by Dr. J. H. P. Giff (*Supplement*, p. 34) that the time had come "to make a stand against this unnecessary and aggravating certification." Dr. Giff was concerned with certificates for surgical corsets. Dr. Curran was dealing with the Civil Service Commissioners, who asked for a full and detailed report which "would place them in a better position to decide on each candidate." Dr. Curran, in our view quite properly, informed the Commissioners that he would state only his opinion whether there was any medical reason why a man should or should not be accepted. He makes the point that a candidate will express himself freely to the doctor if he knows that what he says will be regarded as confidential: this is of particular importance in psychiatric cases. There is, too, the possibility that a candidate will take for granted that anything he says will be regarded as confidential and will assume, as he has every right to assume, that what he says to his doctor will not "be put away in a Government file and perhaps seen by numbers of laymen." That the Civil Service Commissioners did not perhaps feel too happy about the matter is shown in their request to Dr. Curran that he should regard as strictly confidential "the information concerning their practice." With more and more people being caught up in the State machine this question of certification will become more and more important. And as the medical profession comes more under the control of the State the individual doctor will find it increasingly difficult to perform his duty to the individual patient. Dr. Curran asks for "an authoritative ruling on the limits of certification intended for the use of lay bodies." Just who should or would make this a ruling is not clear, but at least a medical man asked to provide such a certificate should make quite sure that the full consent of the person examined is obtained before any certificate or report is submitted. Dr. Edward Glover in the correspondence columns this week (p. 269) suggests that the post-war period may be a silly season for psychology. He may or may not be right, but it is certainly a silly season for certificates.

ERGOTAMINE IN THE TREATMENT OF PRURITUS

One of the methods used for the treatment of pruritus is the administration of ergotamine tartrate. Nevertheless it may cause gangrene, as a recent paper by Kenney[1] shows. Ergotamine tartrate constricts the peripheral vessels and reduces the extent of arterial pulsation. Presumably it is the diminution of the peripheral blood supply that relieves the pruritus, and if the diminution goes too far the danger of gangrene arises.

Lichtman[2] in 1931 began the use of ergotamine ("gynergen") for pruritus, and described 4 cases (2 of renal and 2 of hepatic origin). He gave 1 mg. three times a day by mouth, and stopped the drug as soon as relief was obtained; the results were excellent. Snell and Keyes[3] described a series of 12 cases, and noted that pruritus occurred in 60% of patients with gall stones; they gave ergotamine tartrate by mouth and also by intramuscular injection. Later workers, however, recorded ill-effects. Yater and Cahill[4] had a patient whose legs had to be amputated because of gangrene induced by ergotamine. Gould, Price, and Ginsburg[5] gave 0.25 mg. of ergotamine subcutaneously daily for four days. After the second injection pain and coldness developed in the extremities, followed by cyanosis and impaired sensation. This patient died four days after the initial dose of ergotamine tartrate. These cases are of course exceptional, and as a rule when coldness and cyanosis appear they cease when the drug is discontinued. Further treatment includes papaverine hydrochloride (20–30 mg.) intravenously or orally as a vascular spasmolytic. Ergotamine tartrate is contraindicated in the presence of sepsis or of cardiovascular disease.

Since such serious risks attend the use of ergotamine for the treatment of pruritus, it seems likely that it will soon be replaced by the new antihistamine drugs, such as "anthisan" or "neoantergan,"[6] which are effective at least when the pruritus is associated with urticaria. Extensive pharmacological investigation has revealed no serious toxic effects from the use of these substances.

1 *New Engl. J. Med.*, 1946, **235**, 35.
2 *J. Amer. med. Ass.*, 1931, **97**, 1463.
3 *Med. Clin. N. Amer.*, 1933, **16**, 1455.
4 *J. Amer. med. Ass.*, 1936, **106**, 1625.
5 Ibid., 1936, **106**, 1631.
6 Hunter, R. B., *Lancet*, 1947, **1**, 672.

CONTACT LENSES

BY

C. G. KAY SHARP, M.D.

The possibilities of contact lenses have been appreciated since 1827, but it was not until von Rohr, of Jena, developed the glass contact lens that they became available for general application. In this country Dr. Josef Dallos, of Budapest, in more recent times, has made a material contribution to the development of contact lenses. In general, much secrecy has surrounded the manufacture of contact lenses, and little has been written about them in the medical press. Contact lenses are now an established treatment for definite clinical conditions. They are becoming available in increasing quantities, but the demand far exceeds the supply. At present this is mainly due to the deficiency in the number of trained technicians, and although the position is improving there is still a delay of three to four months before supply.

Varieties

Contact lenses are transparent optical appliances so made that they fit closely over the conjunctiva covering the sclera but provide for a small clearance over the cornea. The earlier contact lenses were, and in some of the principal ophthalmic centres still are, made of glass, but during the late war intensive development took place in the provision of contact lenses made of plastic material.

This material has certain advantages over the glass product: (1) It has more resiliency and elasticity—the thin scleral portion of the contact lens can the more easily adapt itself to any disparity between its curvature and the curvature of the sclera. (2) It is clearer than glass. (3) It is unbreakable, except with gross misuse. (4) It is about one-ninth the weight of glass, thus reducing ocular fatigue to a minimum. (5) It is more resistant to the action of tears; consequently plastic contact lenses require to be repolished less frequently than glass lenses.

For general purposes it may be accepted that contact lenses are made either of glass or of plastic material. The methods by which they are produced are briefly: (*a*) blown glass, as in the production of artificial eyes; (*b*) glass ground from solid glass; (*c*) glass moulded to the shape of the eye: an impression of the eye is taken as for a denture; (*d*) plastic contact lenses fitted to the eye by the ophthalmic surgeon, the final prescription incorporating such adjustments as he may find to be necessary and also the lens power required to correct the residual axial ametropia. All these methods are in use at the present time. Whether or not one of them will eventually prove to have sufficient advantages to justify its adoption as the method of choice remains to be seen. Enough data are not yet available, especially in regard to the use of plastic material, but my own experience, gained in ophthalmic practice and in the Contact Lens Centre at the Royal Eye Hospital, London, tends to show that the advantage lies with plastic material. In all types of lenses the corneal segment of a contact lens is in the initial stages plano, and the additional spherical power, plus or minus, is worked on the anterior surface of the segment.

Advantages and Limitations

One of the results of placing a contact lens on the eye is that the curvature of the cornea is supplanted optically by the spherical curvature of the corneal segment of the contact lens. The presence of a well-fitting contact lens may at first be appreciated as is that of a wrist watch, or a ring on the finger, for the first time, but very quickly the sensation disappears, and there is no difference of sensation whether the contact lens is in position or not.

Patients are not necessarily able to discard their spectacles entirely when adopting contact lenses. Each case has to be considered on its merits by the ophthalmic surgeon; but, generally speaking, contact lenses are an important and useful addition.

The length of time these lenses may be worn varies considerably. Some patients may wear them all day, but much depends on their neuro-vascular condition and on the condition of the conjunctiva, and as a general rule it is considered satisfactory if contact lenses can be worn continuously with comfort for four hours. This period is sufficient for most special purposes—e.g., dances, theatres, cinemas, public functions, sports, and flying duties. Plastic contact lenses are especially valuable in sports and in flying duties on account of their safety and light weight. A greater number of hours' wearing time per day may be obtained by staggering the periods of wearing.

The hypermetrope should see as well with contact lenses as with spectacles, but in the higher powers may at first be conscious of a slightly smaller retinal image. The myope, especially in the higher powers, should see better with contact lenses than with spectacles on account of the larger retinal image.

Indications

Undoubtedly, when the supply of contact lenses permits, the greatest number will be used for cosmetic reasons. The young adolescent who normally wears thick lenses in spectacles may justifiably be recommended to adopt contact lenses for special purposes, whether social, professional, or sports. The presbyope may be advised to wear contact lenses, if desired, but for optical reasons bifocal lenses cannot be prescribed: he must decide whether correction of the ametropia for distant vision or for near vision would be the more useful.

There are indications for contact lenses in many pathological conditions, as an aid to plastic surgery in the prevention of symblepharon, and in the location of intraocular foreign bodies. In incomplete closure of the eyelids, ectropion, entropion, trichiasis, and proptosis contact lenses are prescribed for protective purposes, as they afford immunity from corneal irritation and ultimate ulceration. They are useful in preventing troublesome sequelae in sclerosis of the conjunctiva following trachoma and burns of the eye.

The most remarkable results from the use of contact lenses are achieved in keratoconus, nebulae, and leucomata, and in mustard-gas keratitis. In all these conditions the anterior surface of the cornea presents gross irregularity which cannot be corrected with spectacles. The contact lens replaces this irregular surface, optically, with the regular spherical surface of the corneal segment, on which is worked the spherical correction of the axial ametropia. Consequently, if there is any clear cornea available in the pupillary area, or after an optical iridectomy, contact lenses permit a considerable improvement in visual acuity.

I know of patients registered as blind under the Blind Persons Act who have obtained little or no improvement in visual acuity with spectacles, but whose vision has improved from 3/60 to 6/12 with contact lenses. Instead of being registered as blind persons they have legally been able to obtain a licence to drive a car.

In albinism and aniridia much relief may be obtained from the distressing photosensitivity, especially if an artificial iris be added to the corneal segment. In neuroparalytic keratitis contact lenses provide all the advantages of a tarsorrhaphy with none of its disfigurement. Surgical treatment of the trigeminal nerve or gasserian ganglion is an indication for the provision of contact lenses in anticipation and prevention of a neuroparalytic keratitis. Contact lenses specially fitted with metallic inclusions—e.g., metal bead at 3, 6, 9, and 12 o'clock, or a metal ring at the junction of the scleral and corneal segments—are used in the location of intraocular foreign bodies.

Fitting

The determining factor both in glass and in plastic contact lenses appears to be the careful fitting of the contact lenses by the ophthalmic surgeon. Contact lenses manufactured from a mould of the eye have many advocates, but the errors which may arise from taking a mould are by no means negligible, and the procedure is an unnecessarily unpleasant one. It seems to have no advantages over the simpler method of applying plastic contact lenses, with such adjustments as may be apparent to the ophthalmic surgeon when fitting them.

The contact lens consists of two segments—the scleral and the corneal—each having a different radius of curvature. The scleral segment fits snugly on the conjunctiva covering the

sclera. The corneal segment has a slightly smaller radius of curvature than that of the cornea, thus providing a small space between the cornea and the contact lens. This space is filled with a buffer solution isotonic with the tears. The *p*H of the buffer solution prescribed varies with the *p*H of the tears. An exception to the rule that there should be clearance of the cornea may be made in conical cornea, where a corneal segment may be prescribed in close contact with the corneal cone, so preventing progression and even slightly reducing the effect of the cone.

The contact lens should not be so firmly in contact as to constrict the conjunctival vessels, nor so loosely attached as to permit the buffer solution to escape, with the admission of air bubbles. It should not be so large as to interfere with the movements of the eyes nor so small as to be liable to be caught by the eyelids in movement. For these reasons mass production on standard measurements is impossible, each eye having its own individual requirements.

DEGREES OF MURDER

Sir Norwood East, president of the Medico-Legal Society, read a paper on "Psychiatry and Degrees of Murder" before that body on June 26. His object was to show that while criminality in murder varies widely according to circumstances and personality any doctrinaire approach—any rigid fixity of degrees—would destroy the elasticity which prevails to-day and which on the whole secures in each case perhaps the closest approximation to justice that is reasonably possible.

During the period 1929–38 in Britain the death sentence was passed on 175 persons. Of these 81 were executed, while the sentence of 81 was commuted to penal servitude for life. (The few remaining cases were of sentences quashed on appeal, or dealt with abroad, or, under the Children and Young Persons Act, sentenced to be detained during the King's pleasure.) An examination of the figures for the last 67 years shows a proportionate increase in the number reprieved. In the period 1880–1929 the proportion reprieved was 44.16%, in the following ten years 50%.

As far back as 1866 a Royal Commission favoured the grading of murder, but although various Bills to that intent were introduced into Parliament they were all withdrawn or failed to get through. The difficulties of grading are very great. In grading by indictment, for example, a man might be charged with murder of the second class, whereas the course of the trial might show that it was a deliberate and brutal murder of the first class; but to alter the indictment would not be easy. Grading by the judge was not accepted by the Select Committee on Capital Punishment in 1930 because it would leave too much to the temperament and general attitude of the judge concerned. Grading by the jury was equally unacceptable to that committee because the evidence before the court is restricted to what is directly relevant to the proof of guilt and excludes many important matters which are rightly taken into account in the exercise of the prerogative of mercy. Even when the facts are clear the jury can hardly exercise equitably a grading discretion. Sir Norwood East instanced the usual prejudice against homosexual conduct, which, he suggested, might prevent a jury from assessing without bias the degree of guilt of a man who had killed his male paramour in an outburst of jealousy. There remains grading by the Home Secretary, which in practice does, generally speaking, meet the want of classification.

Findings of the Psychiatrist

The findings of the clinician, toxicologist, pathologist, and psychiatrist, said Sir Norwood East, might all assist in grading murder. The psychiatrist would note the effects on behaviour of various degrees of intelligence and will-power, emotion and temperament, character and personality, and abnormal mental states, and would take cognizance of social, ethical, economic, and other factors, thus demanding a wide approach. Many homicidal crimes were associated with emotional stress. The prevailing psychological atmosphere at the trial of the survivor of a suicide pact or of a deserted woman who had committed infanticide might cause those taking part to temper their judgment with sympathy and leniency, which might be all to the good, but it exemplified the importance of treating the offender individually.

Several degrees of murder were associated with insanity. Three gradations appeared when the crime was associated with mental defect—imbecility, feeble-mindedness, and moral defectiveness. The psychoneuroses and various states of psychopathic personality introduced degrees of culpability not amounting to legal irresponsibility but apparent to the psychiatrist. A jury was not equipped to assess minor degrees of mental abnormality.

Viewed broadly, murder was usually the result of reasoning or emotion or a combination of the two. If it was agreed that the reasoned murder was generally the most criminal, it might also be accepted that gradations of unpremeditated murder would depend to some extent upon whether the accompanying emotional picture was usually praiseworthy or detestable. Love, protectiveness, anxiety, and fear had survival value, and were generally esteemed; jealousy, avarice, cruelty, and revenge were socially destructive and were experienced only in minor degree, if at all, by the average man, and so were censured. If murder resulted from a tense emotional situation connected with an estimable factor it might be more easily condoned than crime which was the result of a factor in itself blameworthy.

Events Surrounding the Crime

Sir Norwood East related a number of cases of murder which had come within his own experience—cases of premeditated murder, cases due to sudden provocation, cases in which callous or cautious conduct following the crime indicated different degrees of criminality. Insanity might be suggested if the death had resulted from a multiplicity of wounds or from the application of successive methods of killing, any one of which would have effected the purpose. But it was almost equally probable that in either case the accused would present no other mental abnormality than an intense emotional disturbance. He instanced a case in which a man killed his nagging wife by striking her on the head with a hammer, by manual strangulation, and finally by tying a stocking tightly round her throat, and yet he showed no evidence of disease or defect, and continued to show none. Combinations of abnormal mental states occurred and also required assessment. In a series of 200 murderers examined by him, and reported on some years ago, who were not insane or mentally defective, 48% confessed their crime before or shortly after arrest. A personal study of the men and their histories led to the conclusion that emotionally the confession was sometimes an act of atonement, as was sometimes a plea of guilty at the trial.

While important advances had been made in recent years in the psychiatric grading of murder due to mental abnormality, it seemed unlikely that the near future would provide a scientific and standardized grading of the many general and psychiatric imponderables involved, applicable to all cases, and capable of maintaining the present equitable balance between public safety and humanely directed clemency.

Sir Norwood East concluded his analysis of the situation by deprecating pedantic disputes between the supporters of the doctrines of determinism and free will. These would have no place in the practical problems of grading, though at the same time the importance of inherited causal factors of disposition and temperament, or of the early years of life in the formation of character, could not be denied. Even in later years any person might be profoundly influenced for good or ill by his associates and often fail to realize what was happening. "It is frequently said that the mental condition of the man who commits murder is abnormal at the time. In cases of insanity, mental defectiveness, or minor mental disorder the abnormality is a pathological deviation from the mental condition of the so-called normal man. In many other cases it is no more than a transient deviation from the man's usual self, and is associated with excessive instinctual activity, excessive emotional tension, lessened control, and disregard for social and ethical values. In a few cases the crime expresses the character of the criminal, and is neither the result of a pathological deviation from the normal nor a temporary deviation from himself." Perhaps they might go further and suggest that, other things being equal, these criteria represented a rising scale of culpability.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION

CONGRESS AT AMSTERDAM

The Fifth Congress of the Medical Women's International Association, held at Amsterdam from June 24 to 28, was attended by over 350 delegates representing 16 different countries. It was extremely successful from the international point of view, and was marked by the outstanding hospitality of the Dutch Government, people, and medical women. The Congress was opened by the Minister for Social Affairs. The Burgomaster and Municipality of Amsterdam entertained the delegates at a reception, and the Vice-Chancellor of Leyden University, who played a prominent part in the resistance movement when the Nazis tried to force him and his staff to adopt a Nazi constitution, received the Congress at the University.

Prof. A. Ruys, of Holland, was elected president for the next three years; Mme Montreuil-Straus, of Paris, was elected honorary secretary, and Dr. Doris Odlum, of Great Britain, honorary treasurer. Miss Louisa Martindale was made an ex-officio member of the governing body, and the following were appointed vice-presidents: Dr. Agnete Braestrup (Denmark), Dr. Eriksson-Lihr (Finland), Prof. Gauthier-Villars (France), Dr. Guest (Canada), Dr. Miloshevitch (Poland), and Dr. Barbara Stimson (United States). Dr. Bertha Van Hoosen (U.S.A.), who was one of the Founder Members, was made an Honorary Member in recognition of her outstanding services to the Medical Women's International Association. It was decided that the secretariat should be located in Paris for the next three-year period.

The Council for 1949 will be held in Helsingfors, and the next Congress will be in Philadelphia in 1950 or else in Paris. Mme Montreuil-Straus and Dr. Odlum will act as observers at the meeting of the General Assembly of the World Medical Association in Paris next month.

World Reconstruction

Prof. A. Ruys, opening the discussion on "The Responsibility of Medical Women in the Reconstruction of the World, as Physicians, as Social Workers, and in International Work and International Co-operation," dealt with the situation in Poland, Hungary, Czechoslovakia, France, Belgium, and the Netherlands. All six countries had been heavily damaged by the war; five were occupied by the Germans. In those countries where hygienic conditions were good before the war and the incidence of infectious diseases had been low, as in the Netherlands, reconstruction was proving a much easier task than in others whose hygienic conditions were less advanced.

The death rate increased in all six countries. In Poland the population was reduced by 31.4% owing to the extermination measures of the Germans. In the Netherlands the death rate, which was low before the war (8.6), rose to 15.4 in 1945, but in 1946 the Netherlands, as well as Belgium and Hungary, had returned approximately to the pre-war figures, whereas in the other countries the death rate was still much higher. Typhus was a major problem in Hungary, Poland, and Czechoslovakia, but not in the West. Cases of typhoid increased greatly in Europe, except in France, but by 1946 the figures had gone down considerably, especially in the Netherlands. The incidence of tuberculosis also rose appreciably, except in France; but here there was a high incidence even before the war.

The birth rate was still very low in Poland, but in the Netherlands it was exceptionally high. Prof. Ruys regarded this as evidence of the great vitality of the people, who, after a winter of extreme starvation, quickly regained their strength. Infant mortality had been exceptionally high in 1945 in Belgium, the Netherlands, and France, but by 1946 the figures were at the pre-war level.

In Poland, Czechoslovakia, and the Netherlands rations were now adequate in calorie values, but fats and proteins were still deficient. In Belgium the food situation was nearly back to normal, but in France and Hungary conditions were far from satisfactory. Housing conditions were terrible in large parts of Poland, more than 80% of the buildings having been destroyed. In Hungary only 25% of the houses of Budapest were undamaged; in Czechoslovakia one-quarter were destroyed by bombing. In the Netherlands 23% of the buildings were damaged by war or flooding. In France and Belgium there had been little damage except in the Ardennes, but everywhere there was a deficiency because so few new houses had been built.

Part Played by Medical Women

The proportion of women doctors in Poland was 25%; in Czechoslovakia 15%; in Hungary 10%; in the Netherlands 10%; in France 5%; and in Belgium 1.5%. In Poland there were nine women professors and nearly 200 women research workers at universities. A woman doctor was head of the Ministerial Department for Women and Children. In Czechoslovakia and Hungary they had the same rights as their male colleagues, but in fact did not attain to the higher posts. In the Netherlands and France medical men and women had equal rights, and on the whole the outstanding medical women had no difficulty in obtaining the higher positions. In the Netherlands two were professors in the University of Amsterdam. In France there were professors at the universities and some women had charge of hospitals. In Belgium there was one woman professor at the University of Brussels, but on the whole medical women had very little influence.

In all these countries women doctors took part in general practice and in nearly all the specialties, but they showed a preference for paediatrics, gynaecology and obstetrics, psychiatry, ophthalmology, and preventive medicine. Polish women apparently were playing a relatively large part in the social and hygienic reconstruction of their country. In the other countries they had still to struggle against considerable male prejudice.

In international organizations there were very few medical women. All the countries except Hungary felt that women had special responsibilities which differed from those of their male colleagues. Up till now the voice of women in the international field had been too faint. This was not always the fault of the men. Dr. Ruys thought that medical women were often too timid, or had too little self-confidence, or perhaps were spiritually too lazy, to make themselves heard. She felt that only a strong effort on the part of the women themselves would make Governments aware of the contribution that their women doctors could make.

Conditions in Scandinavia

Dr. Eriksson-Lihr dealt with conditions in Denmark, Finland, Norway, and Sweden. The birth rate had increased noticeably in all four countries between 1939 and 1946. The death rate in Sweden had gone down. In Norway it had greatly increased, and Finland lost nearly 79,000 people during the war. In all four countries the death rate in 1945 and in 1946 was lower than in 1938. Infant mortality in 1945 and 1946 also showed a gratifying reduction, although it had greatly increased during the war years.

In Finland and Norway food was often deficient, and cases of hunger oedema occurred. Lack of vitamin C was seen in Finland, and of vitamin A in Norway in adults. Curiously, dental caries decreased in Finland whereas in nearly all countries it had increased.

In Sweden there were 7.5% of medical women, in Norway 8%, in Denmark 9%, and in Finland 17%. The value of public education in health subjects was stressed, but all four countries felt that some measure of compulsion was necessary to make sure that the public used the preventive services. They all felt that women should play a larger part in public affairs. She quoted an old Chinese saying to the effect that women are never privileged to prevent disaster but are always called on in the reconstruction.

United States

Dr. M. Eliot, Associate Chief of the Children's Bureau, U.S. Department of Labour, said that housing was a great problem in America. Some 1,200,000 American families lacked separate dwellings and were sharing with others in October, 1945. Since then 1,600,000 married veterans had returned without homes

to go to. Another 1,300,000 single veterans had married. Adequate housing would require new construction at four and a half times the pre-war rate. The problem of juvenile delinquency was magnified and aggravated during the war and still continued to be serious.

Women doctors amounted to some 5% of the profession, or about 8,250. The majority engaged in private practice, 85% in cities and towns; 5% were qualified as specialists, especially in paediatrics, psychiatry, and pathology. In April, 1943, after two years' effort and with the support of all women's organizations, women doctors were appointed to the Army and Navy corps. Promotion was slower than for men. The demand for women doctors in civil practice had increased greatly. Women had encountered many handicaps in relation to appointments on hospital staffs. A number of women served as members of the House of Delegates of State Medical Societies. Group practice had greatly increased, privately arranged among the doctors themselves.

In the absence through illness of Dr. Margaret C. Macpherson, Dr. Janet Aitken read her report on Great Britain. There were 51,533 doctors in Great Britain of whom, roughly, one-seventh were women, with about 5,000 in active practice. Women in general practice were firmly established and they were also employed in the public health services. Openings in consultant practice were more limited. The British Medical Women's Federation was the only organization representing medical women as such. It had a membership of some 2,200, was representative, and was recognized by Government Departments, public authorities, and the British Medical Association.

General Discussion

These and other reports were followed by a lively discussion in which members of all the countries present took part. Certain interesting features emerged.

1. The main post-war problem was unanimously agreed to be lack of houses with all its attendant social and moral dangers.
2. The figures for delinquency were still much higher than before the war in nearly all countries, and there was also some increase in criminality.
3. The vital statistics of most countries were surprisingly good. Nutrition was recognized to be the main factor in maintaining physical health and to a great extent in supporting morale.
4. The countries that were more advanced before the war, even though they were occupied, had, on the whole, made a remarkable recovery. The less advanced countries were obviously more handicapped and conditions were still unsatisfactory in most of the Central European countries.
5. Communicable diseases had not increased to the extent that had been feared, although there was an increase in most countries in tuberculosis and venereal disease.

Finally it was agreed that the position of medical women varies in different countries. In those which were more advanced the social status of women was higher than in the more backward countries. It was noteworthy, however, that the position of medical women in Poland appeared to be relatively high. Although in most countries they had normally equality of opportunity, many women experienced difficulty in obtaining the higher posts, and it was felt that this was due not so much to lack of capacity as to a certain amount of prejudice. There appeared to be general agreement that women had a special contribution to make to reconstruction by the very fact that they were women, a contribution which should be made in close co-operation with their male colleagues. It was also felt that medical women had tended in the past to take too little interest in public affairs, and that it was their duty to fit themselves to take part in all the activities which regulated the life and future of their nation and mankind.

Psychiatric social work has a wide range. Three types of work of particular interest to general practitioners are described in pamphlets recently published by the Association of Psychiatric Social Workers. They are: *Interviews with Parents in a Child Guidance Clinic* (1s. 3d.); *Some Aspects of Foster Home Placement for Difficult Children* (9d.); *War Damaged Youth* (1s. 9d.). In each case the price given includes postage, and requests for copies should be addressed to the Hon. Secretary, Publications Sub-Committee, Association of Psychiatric Social Workers, 4, The Drive, Acton, London, W.3.

CONGRESS OF PHYSIOLOGISTS

SOME IMPRESSIONS

[FROM A CORRESPONDENT]

The first International Physiological Congress was held in Basle in 1889, under the presidency of Frithiof Holmgren (1831–97). Last month (July 21–5), Sir Henry Dale, O.M., presided over the seventeenth of the series at Oxford. At the first congress over 120 members had represented 13 countries, while over 1,200 members from 38 countries were assembled at Oxford for the seventeenth.

The sixteenth congress had been held at Zürich in 1938 in the large building of the Federal Technical University (Eidgenössische Technische Hochschule). At Zürich it had been decided that the next congress should take place in Oxford in 1941. The seventeenth congress was therefore six years overdue. The background against which it took place was very different in many ways, but in some ways strangely similar. This time, however, there was curiosity as to whether the Russians would be represented, and it was with a sense of pleasure and almost of relief that it was learned that there was a substantial Russian delegation led by Academician Orbeli.

To a Londoner who had not visited Oxford since 1938 it seemed that the war had left few traces, and this impression must have been even more striking to visitors from many of the European countries represented. But this was nevertheless a very sober congress with little inclination and, indeed—in Oxford—little opportunity for merriment.

Preliminaries

Most of the members arrived, as requested, by the early evening of Monday, July 21, and, after finding their rooms and studying the maps printed in a booklet of General Information, made their way to Rhodes House, which was the headquarters of the secretariat. Each member was there presented with a detailed programme of communications, film-shows, and demonstrations, a printed List of Members, a 398-page paper-bound book containing abstracts of communications, and—a most delightful surprise—a copy of a new edition of Sherrington's *Integrative Action of the Nervous System* sponsored by the Physiological Society and published by the Cambridge University Press. Thus at the same time was a tribute paid to a great physiologist-philosopher and a souvenir of more than sentimental value given to each member of the congress. Although it was sad that Sherrington's health did not permit him to attend the congress, his new foreword to the *Integrative Action*, and a brief message of welcome read by the President at the opening session, went far to compensate for his absence.

The first official function was an evening reception given by H.M. Government at Christ Church. Guests were received by the Rt. Hon. H. A. Marquand, the Paymaster-General, who was late. This, and the large number of members, some of whom were encumbered by wives, meant that the last of the weary guests had been queuing for over an hour before being admitted to the promised land of free drinks in the Great Hall. Whether many physiologists thought a perfunctory handshake with a politician an adequate excuse for retarding for so long their progress to the bar is a matter for conjecture. However, once in the Great Hall and after the first drink or two, spirits revived, old friends were spotted and spoken to, and new friendships arose between those who had previously exchanged only reprints. So were some of the main objects of an international congress fulfilled in the first evening.

The opening session was held the following day in the Sheldonian Theatre. Sir Henry Dale made a brief speech of welcome and then called upon Prof. B. A. Houssay (Argentina) Dr. Robert Lim (China), Academician Orbeli (U.S.S.R.), and Prof. H. Fredericq (Belgium). Some of the foreign speakers were interesting, if involuntary, exemplars of the newer relation between science and the State. Houssay, whose name is at some time or another familiar to every medical student, has been deprived of his Chair of Physiology at Buenos Aires because he signed a manifesto protesting against political intervention in the affairs of his university; Robert Lim appeared in

general's uniform, and the Soviet physiologist dragged in an irrelevant reference to the "freedom-loving nations." A further manifestation of the brave new world of 1947 was a telegram read by the president from Dr. Joseph Needham—who makes lightning appearances at congresses as a sort of Unesco good fairy—announcing that he was too busy to attend and read his scheduled paper on "International scientific co-operation and the value of an International Union of Physiology."

The opening session over, members thronged into the garden of Trinity College for the congress photograph.

Communications

As usual, the number of communications—over 350—was so great that it was a physical impossibility to attend more than a very small fraction of them. At any time, nine communications were being read or discussed simultaneously in nine different buildings, in addition to the films and demonstrations that were taking place in other laboratories or departments. The number of the communications precludes any but a passing reference to a few samples. The material of many of them was already familiar, and many others were concerned with the minutiae of small and specialized sections of physiology.

In contrast to the congress of 1938, there were relatively few communications from biochemists; but there was substantial representation of biophysical investigation, especially in relation to neurophysiology. Mention will be made below only of a few communications on subjects of actual or potential chemical interest. K. H. Beyer *et al.* (U.S.A.) had been working with a new compound—caronamide—which was evolved with the object of finding an agent which would act on the kidney in such a way as to retard its excretion of penicillin, thus reducing the wasteful elimination of the drug via the urine. L. Brull (Belgium) described an ingenious experimental technique for treatment of acute uraemia such as that which follows poisoning with salts of heavy metals. Dogs were nephrectomized, and when full uraemia had developed a normal kidney from a dog killed up to one hour before was transplanted into the neck. There was a considerable drop in the blood urea of the animals, and in some cases the transplanted kidney survived for five days. J. B. S. Haldane (Britain) described the disagreeable effects upon himself and colleagues of oxygen inspired at a pressure of several atmospheres. Extreme differences in the time of onset of these effects were observed in different individuals and in the same individual at different times. E. Jacobson (U.S.A.) announced that it is physiologically impossible to be simultaneously in a state of emotional tension and muscular relaxation, and proposed progressive relaxation as a method of treatment for psychiatric and psychosomatic disorders. J. McLeod (U.S.A.) claimed that penicillin protects spermatozoa against the damaging effects of high oxygen-tensions. S. Wolf and H. G. Wolff (U.S.A.) had studied the gastric blush in a subject with a gastric fistula larger than that of Alexis St. Martin—Beaumont's famed and reluctant patient. D. Lehr found experimentally and clinically that mixtures of two or three sulphonamides had the same antibacterial effect as, but less toxicity than, the same total quantity of a single sulphonamide. G. V. Anrep (Egypt) reported a powerful coronary vasodilator—khellin—derived from the seeds of an umbelliferous plant which grows widely in the Middle East. No new hopes were raised by V. Korenchevsky (Britain), who has spent the past decade weighing the viscera of rats after injection of various sex steroids, in describing effects of polyhormonal treatment of aged rats.

A new and horrible term—"successfully prophylacticated animals"—was introduced by G. E. Wakerlin (U.S.A.) and a host of colleagues in the printed abstract describing the alleged protective action of crude renal extracts against experimental hypertension in dogs. L.-P. Dugal and M. Thérien (Canada) found that guinea-pigs could withstand extremes of cold better after dosing with ascorbic acid, and E. H. Venning and J. S. L. Browne (Canada) that the adrenal response to injury of the debilitated patient was absent or weak compared to that of the healthy subject.

E. Braun-Menendez (Argentina) summarized the work of the Buenos Aires school on the mechanism of renal hypertension. Renin, an enzyme secreted by the kidney, reacts with hypertensinogen to form hypertensin, which has a pressor and vasoconstrictor action and is destroyed by hypertensinase. The sting of the stinging nettle is caused by histamine and acetylcholine, according to N. Emmelin and W. Feldberg (Britain). I. Greenwald (U.S.A.) questioned, partly on the basis of historical studies, whether endemic goitre is really due to deficient iodine intake. A. von Muralt and E. Lüscher (Switzerland) reported a factor prepared from the brain, spinal cord, and myelinated nerves of young animals which increases the rate of regeneration of cut and degenerated nerves. Scorpion venom has a decurarizing action on striated muscle, according to E. C. del Pozo and L. G. Anguiano (Mexico). Results obtained by R. G. Grenell (U.S.A.) suggest that adrenal cortical hormones may find a new clinical application in the combating of cerebral oedema following head injuries. E. Mellanby (Britain), in the discussion which followed his paper on the rickets-producing action of cereals, believed that vitamin D might act by stimulating the production of an enzyme which breaks down phytic acid—the factor in cereals which combines with dietary calcium to form an insoluble phytate.

Many other communications could, and probably should, be mentioned, and reference to some of the most important has been deliberately omitted because the subjects are too difficult or their practical bearing at present too remote.

Books and Films and Early Instruments

Unquestionably the most interesting and significant of the side-shows was the exhibition of early medical works at the New Bodleian Library. This included a number of medical manuscripts, some of them beautifully illuminated, and one of them (of about A.D. 1290) containing the earliest known representation of a dissection of a human cadaver. Among the more famous books exhibited were the *Fabrica* (1543) of Vesalius; Roesslin's *The byrth of mankynd* (1552); proofs of an incomplete and suppressed reprint of 1723 of Servetus's *Christianismi restitutio*, the theological treatise which contained the first (1553) printed description (but without supporting evidence) of the lesser circulation; Paré's surgical works; the *De venarum ostiolis* (1619) of Fabricius; Helmont's *Ortus medicinae* (1648); Hooke's *Micrographia* (1665); Borelli's *De motu animalium* (1680–1)—in which the living organism is depicted as a system of pumps and levers; the rare first edition (1733) of the *Haemastaticks* of Stephen Hales—who made pioneer investigations of the physiological dynamics of plants and animals while a parson at Teddington; Percival Pott's work (1768) on head injuries, and many other works which were the foundations upon which the medical science of to-day was built.

Other cases were devoted to an exhibition of documents illustrating "The Oxford Scene." This started with the Chancellor's Register, written in the first half of the 14th century, and finished with a letter from Lord Nuffield to the Vice-Chancellor offering to endow a postgraduate medical school at Oxford. A typescript note on "Medical Studies at Oxford" confesses that "The Laudian Code of 1636 required lectures on Galen and Hippocrates, and these remained, with Aretaeus and Celsus, as the principal medical authors studied until nearly the end of the nineteenth century"—surely rather an exaggeration.

Opposite the New Bodleian was an exhibition of early scientific apparatus pertaining to medicine and surgery. This was arranged by the Museum of the History of Science, which is housed in the Old Ashmolean, and was chiefly remarkable for the very fine collection, of well over a hundred pieces, of early microscopes. The remaining exhibits were a rather random collection of objects ranging from anatomical preparations to pill-rolling boards.

Mention should also be made of the bookstall set up by Blackwell's in Rhodes House. Here, members of the congress could purchase or order books on the spot, and the wide selection of medical and physiological works displayed drew many British and foreign visitors—some of the latter deploring their scant supply of currency. Blackwell's had managed to publish, just in time for the congress, *Studies of the Renal Circulation*, by Trueta, Barclay, Daniel, Franklin, and Prichard—a book which had been awaited with much interest since these authors published a preliminary communication nearly a year before. On the Saturday following the congress, Dr. A. E. Barclay's pioneer work in developing cineradiography as a technique of physiological research received fitting recog-

nition by the award of an honorary D.Sc. by the University. Another of Blackwell's publications which was much-thumbed was John F. Fulton's massive biography of Harvey Cushing.

Many of the members showed short films demonstrating their work, but a special showing of new educational films made by I.C.I. was arranged for Wednesday evening at the Taylor Institution. This entertainment was packed to more than capacity—possibly because of a widespread interest in visual education and possibly because of the lamentable absence in Oxford of *Vergnügungsmöglichkeiten* of the sort available in Zürich. The brilliant series of teaching films on anaesthesia previously sponsored by I.C.I. had set a very high standard, and opinions were divided as to the value of this new physiological series. The first of them demonstrated an extraordinarily elaborate technique in which, in brief, a system of pumps was substituted for the heart of a dog. If this was anything more than a complicated piece of gadgetry the film did not indicate it. Another film on the action of acetylcholine was far more satisfying as a teaching film, although it exemplified one of the dangers of the medium—oversimplification. In a film, bald and uncompromising statements are made, and there is little room for qualifying remarks and reservations. Nevertheless these film demonstrations succeeded in giving a remarkably vivid portrayal of what the demonstrator was trying to do.

Closure

At a Convocation of the University in the Sheldonian Theatre, to which the whole congress was invited, honorary doctorates of science were conferred upon C. H. Best (Canada), H. S. Gasser (U.S.A.), B. A. Houssay (Argentina), A. Krogh (Denmark), and A. Szenti-Györgi (Hungary). The closing session of the congress followed immediately, and it was decided that the eighteenth congress should be held in 1950 in Copenhagen. Suitable tribute to the admirable work of Capt. E. W. Geidt and Prof. E. G. T. Liddell in organizing the congress was paid by the president, who also showed the specially bound copy of the congress edition of the *Integrative Action of the Nervous System* which had been signed by leaders of physiology of several nations for presentation to its author.

INTERNATIONAL SOCIETY OF SURGERY

The twelfth congress of the International Society of Surgery will be held in London from Sept. 14 to 20, under the patronage of His Majesty the King. The programme is as set out below, but, owing to the unexpectedly large number of visitors who have expressed their intention of attending, arrangements have been made, with the kind co-operation of the British Medical Association, to hold some of the scientific sessions in the Great Hall of B.M.A. House in Tavistock Square, which is a short walking distance from University College in Gower Street. Details of any such alterations will be announced from time to time and will be posted in the registration office at the College daily.

Sunday, Sept. 14, 10 a.m. to 6 p.m., Registration Office and Bureau open all day at University College, Gower Street, W.C. Members of Hospitality and Ladies' Committee in attendance; 8 p.m., Evening reception and reunion of members at the Royal College of Surgeons of England (Lincoln's Inn Fields, W.C.), by invitation of the President and Council of the College. Informal dress.

Monday, Sept. 15, 9 a.m., Registration Office and Bureau open at University College; 9.30 a.m., Meeting of International Committee at Royal College of Surgeons of England; 11 a.m., Inaugural ceremony in the Hall of Lincoln's Inn, by kind permission of the Treasurer and Masters of the Bench of the Honourable Society of Lincoln's Inn. Group photograph of congress; 2 p.m., Opening of exhibition of surgical instruments at University College by Dr. Leopold Mayer, President of the Congress; 2.30 p.m., First scientific session at University College: Role of Penicillin in Surgical Practice, Sir Alexander Fleming, F.R.C.S., F.R.S. (London); 4.30 p.m., Recent Advances in Arteriography and Venography, Prof. Dos Santos (Lisbon); 5.30 p.m., Opening of Wellcome Historical Exhibition at South Kensington by Sir Alfred Webb-Johnson, P.R.C.S.; 8.30 p.m., Reception by the President of the Society at Savoy Hotel.

Tuesday, Sept. 16, 9 a.m., Bureau open at University College; 9.30 a.m., Second scientific session at University College: Recent Advances in Vascular Surgery, Prof. René Leriche (Paris); 11.30 a.m., Surgical Treatment of Pulmonary Stenosis, Prof. Alfred Blalock (Baltimore); 2 p.m., Visits to hospitals, parties conducted from University College; 2.30 p.m., Deferred discussion, if required; 6 p.m., Reception by Viscount Kemsley at Chandos House, Queen Anne Street, W.; 8 p.m., Dinner at Royal College of Surgeons of England to delegates and members of the International Committee given by the President and Council of the College.

Wednesday, Sept. 17, 9 a.m., Bureau open at University College; 9.30 a.m., Third scientific session at University College: Operative Treatment of Fractures, Prof. Danis (Brussels); 11.30 a.m., Results of Early Operation in War Wounds of the Lungs, Dr. Bastos Ansart (Barcelona); 2 p.m., Visits to hospitals, parties conducted from University College; 5.30 p.m., Meeting of International Committee at University College; 5.45 to 7 p.m., Reception in the Great Hall of the British Medical Association House by invitation of the President and Council of the Association; 8 p.m., Reception at the Royal Society of Medicine, 1, Wimpole Street, W., given by the President and Council of the Society. Sir Gordon and Lady Gordon-Taylor will receive the guests.

Thursday, Sept. 18, 9 a.m., Bureau open at University College; 9.30 a.m., Fourth scientific session at University College: Results of Heparin in Surgery, Dr. C. Crafoord (Stockholm); 11.30 a.m., Recent Progress in the Treatment of Burns, by a Russian surgeon; 2 p.m., Visits to hospitals, parties conducted from University College; 5 p.m., General Assembly of the International Society at University College; 8 p.m., Reception by the Royal College of Surgeons of England at the College, Lincoln's Inn Fields, W.C.

Friday, Sept. 19, 9 a.m., Bureau open at University College; 9.30 a.m., Fifth scientific session at University College: Role of Vasodilatation in Arterial Disease, Dr. Diez (Buenos Aires); 11.30 a.m., Skin Defects: Their Repair by Flaps and Free Skin Grafts, Prof. T. Pomfret Kilner, F.R.C.S. (Oxford); 2 p.m., Visits to hospitals, parties conducted from University College; 4 to 6 p.m., Reception by Sir Hugh and Lady Lett at the Hall of the Society of Apothecaries of London, Black Friars Lane, Queen Victoria Street, E.C.; 8 p.m., Reception by His Majesty's Government.

Saturday, Sept. 20, 9.30 a.m., Deferred discussions, closure of scientific business; 2 p.m., Conducted visits to places of interest in London; 2.30 p.m., Pilgrimage of Homage from the Bureau to places of interest connected with Hunter and Lister; 8 p.m., Official dinner at Dorchester Hotel.

Sunday, Sept. 21, Excursions to places of interest near London—e.g., Windsor, Kew, etc.

During the week of the Congress there will be an exhibition of Hunteriana, specimens, books, etc., at the Royal College of Surgeons of England. Parties of not more than 12 persons will be conducted over the College at times to be announced.

The exhibition of surgical instruments and appliances, books, etc., will be at University College and will be open each day from 9.30 a.m. to 5 p.m., and on Saturday until noon.

Tickets for visits to hospitals will be issued at the Bureau, where parties will assemble before being conducted to the various hospitals.

A special programme of entertainments for the ladies will be available at the time of the Congress.

On Monday, Sept. 22, those members who have previously made the necessary arrangements will travel to Edinburgh. On Tuesday, Sept. 23, registration will begin at 9.30 a.m. in the Department of Surgery, University New Buildings, Edinburgh. An attractive programme of operations, symposia, lectures, demonstrations, etc., has been prepared. Social functions include a luncheon by the Secretary of State for Scotland, and receptions by the Royal College of Surgeons of Edinburgh and by the University. There will also be a garden party given by the Lord Provost and the Town Council and a series of excursions. The visit terminates on Friday, Sept. 26.

Prof. G. Grey Turner, M.S., F.R.C.S., is Chairman of the British Executive Committee; Sir Alfred Webb-Johnson, P.R.C.S., Chairman of the Consultative Committee; and Mr. H. W. S. Wright, M.S., F.R.C.S. (9, Weymouth Street, Portland Place, London, W.1) the Honorary Secretary of the Congress. The Honorary Treasurers are Mr. J. E. H. Roberts, O.B.E., F.R.C.S. (89, Harley Street, London, W.1) and Mr. Victor H. Riddell, F.R.C.S. (68, Chester Square, London, S.W.1).

The Secretary of State for Scotland recently visited the Rehabilitation Centre at Bridge of Earn, which was transferred to the hospital there from Gleneagles in April of this year. The scheme was started to admit coal miners in 1943, and in 1944 extended to admit industrial workers generally, and finally all classes of males. The Secretary of State praised the success attained (82% restored to fitness), and said that it seemed to be not generally known that the facilities were available to everybody who could benefit from them. A doctor could arrange for the admission of a patient, the only limit being the accommodation available and the absence at present of facilities for women patients.

THE KING'S FUND: FIFTIETH ANNIVERSARY

H.R.H. The Duke of Gloucester presided at the fiftieth annual meeting of King Edward's Hospital Fund for London, held on June 27 at St. James's Palace. A message was read from the King which stated:

"I shall, as Patron, follow with close interest the future of the Fund in the changing conditions of to-day. I am confident that those who have contributed so generously in the past will continue their support, and I know that all responsible for the management of the Fund will see that its great resources and influence are wisely used in the service of the sick and those who tend them in the hospitals."

The Duke of Gloucester said that now that the decision to nationalize the hospitals had been taken new responsibilities would devolve upon the Fund and new opportunities open before it. The National Health Service Act would bring to an end the distinction between voluntary hospitals and those maintained by local authorities. The Fund would be called upon to help both kinds of hospitals in the future. The fact that in this great reorganization the Fund remained free to do its work in its own way was a mark of public confidence in its management. He referred to the good progress made in the scheme for providing bursaries for administrative and other officers, and also to the grants authorized for travel. He said that representatives of Charing Cross Hospital had been afforded the means of making a Continental tour, visiting new hospitals at Basle, Zürich, Paris, and Stockholm to study the latest developments in hospital reconstruction, bearing in mind the new Charing Cross to be built at Harrow.

Finally he mentioned the interest which the Fund was taking in the work of the voluntary hospitals and homes accommodating incurable and elderly cases. In several instances special grants had been authorized, and as soon as a survey was complete it might be necessary to sanction expenditure under this head for capital purposes.

The Treasurer, Sir Edward Peacock, said that the income of the Fund had been well maintained and had been little affected by the proposals of the National Health Service Act. The City Companies had continued their beneficence. The total receipts in 1946, including legacies, amounted to £491,409, an increase of over £26,000 on the year before. The ordinary distribution of £302,750 had been maintained, and £47,500 had been provided by special grants.

Activities of the Fund

The chairmen of various committees of the Fund then presented brief reports. Dr. Morley Fletcher, for the Nursing Recruitment Committee, stated that during the year over 4,000 candidates for training had been advised at the recruitment centre, and help had been given in finding hospital vacancies for groups of girls coming from the Colonies and one or two foreign countries. Sir Harold Wernher described the work of the Emergency Bed Service. Over 10,000 calls for help in finding a hospital bed for a patient had been dealt with during the year. The shortage of beds, even for urgent cases, was more acute than it had ever been, even though the London voluntary hospitals had reopened several thousands of beds and had only about 15% of their pre-war complement closed.

Sir Hugh Lett presented the report of the Committee on Hospital Diet, and stated that the standard of feeding in the hospitals in the Fund's area was definitely better than it had been, and it was hoped that it would improve still further, notwithstanding the problems of rationing and shortage of equipment. Sir Henry Tidy referred to recent developments of the work of the Fund in connexion with convalescent homes. A directory of such homes, he said, was being prepared, and arrangements were being made for medical men and laymen to visit them. The Fund had been able to assist in the reopening of homes closed during the war.

Lord Moran, in moving a vote of thanks to the Duke of Gloucester for presiding, said that perhaps the first purpose of the new Act was to make one standard for hospital services, so that inefficient hospitals might be brought up to the level of the efficient. But in such standardization care must be taken not to rob the hospitals of their personality or to lose those features which, with the fruits of research, had sent the good name of our hospitals over the world.

BEIT MEMORIAL FELLOWSHIPS FOR MEDICAL RESEARCH

Sir Henry Dale, O.M., G.B.E., F.R.C.P., F.R.S., and Lord du Parcq have been appointed to succeed Lord Rayleigh, F.R.S., and Lord Macmillan of Aberfeldy as trustees of the Fellowships.

The following elections have been made:

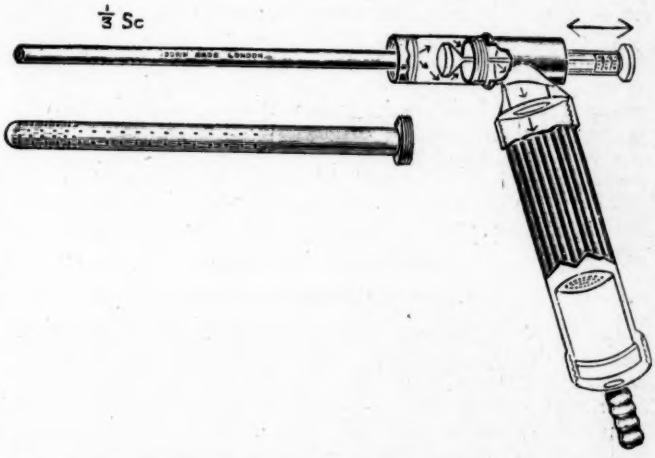
Fourth Year Fellowship (£700 *a year*): F. Sanger, B.Sc., to study the structure of proteins, with special reference to insulin (at the Department of Biochemistry, University of Cambridge).

Junior Fellowships (*Normal value* £600 *a year*): J. W. Lyttleton, M.Sc., to study the purification and subsequent physico-chemical characterization of proteins involved in the coagulation of blood (at the Lister Institute of Preventive Medicine); A. J. Marshall, B.Sc., to study the humoral and nervous control of the decidual reaction of the mammalian uterus (at the Department of Zoology and Comparative Anatomy, University Museum, Oxford); L. Silberman, B.A., B.Sc., to study the community costs of tuberculosis in terms of public assistance and industrial outlay to patients and dependants, man-day wastage, and social service provisions, with special reference to the problem of reinstatement and re-vocation (at the University of Birmingham); G. Weber, M.D., Ph.D., to investigate the reactions and behaviour of physiologically important proteins (at the Sir William Dunn School of Biochemistry, University of Cambridge).

Preparations and Appliances

MODIFIED SIMPSON-SMITH SILENT SUCKER

Mr. M. D. SHEPPARD, Chelmsford, Essex, writes: The Simpson-Smith silent sucker is too well known to need description or appreciation. It is, however, occasionally defeated by blood which clots in the rubber tubing between it and the collecting bottle, or by pieces of fibrin and pus which tend to gather round the valve and cause an obstruction. For these reasons



it seemed desirable that clots should be trapped and prevented from entering the rubber tubing and that the valve mechanism should be enlarged and made easily accessible for cleaning.

In the modified sucker the principle on which the apparatus depends for its success has not been altered. The valve tubing and seating have been much enlarged and the valve can be cleaned by unscrewing the handle leading from it. This handle forms part of a much enlarged connexion between the valve and the rubber tubing and contains a sieve which will trap any solid matter large enough to cause a block in the tubing. Such a block is always difficult to locate and remove during the flurry of the operation when blood or other fluid floods the surgeon's field of action. This sieve often clogs up but is soon cleaned; the chamber can be emptied of its contents by unscrewing the base.

Messrs. Down Bros. have kindly carried out these modifications and I am indebted to them for their useful suggestions and co-operation.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knights: Major J. F. Hamilton and Dr. R. D. Thomas. *As Commanders (Brothers):* Surg. Rear-Admirals A. E. Malone, C.B., K.H.P., and H. M. Whelan, K.H.S. (since deceased), Brig. G. S. McConkey, O.B.E., Major G. S. Phillips, Drs. F. L. Richard, P. S. Selwyn-Clarke, C.M.G., M.C., C. C. B. Gilmour, C.B.E., J. M. Hermon, G. P. Huws, and N. Hamilton Fairley, C.B.E. *As Officers (Brothers):* Surg. Capts. L. F. Strugnell, R. C. May, O.B.E., M.C., and K. D. Bell, R.N., Cols. C. R. Croft and T. J. L. Thompson, O.B.E., M.C., Lieut.-Cols. F. A. Bevan, T.D., and T. F. Briggs, R.A.M.C., Lieut.-Col. M. P. Atkinson, I.M.S., Lieut.-Col. C. P. Stevens, M.B.E., Major T. W. Carrick, R.A.M.C., Drs. A. Byrne-Quinn, J. A. L. Roberts, G. C. Williams, J. MacKenzie, K. Chrysanthis, H. G. Davies, H. H. Warren, T. W. David, G. R. Jones, G. P. Williams, J. W. Reid, and C. A. Bence. *As Associate Officer (Brother):* Col. S. L. Bhatia, C.I.E., M.C., I.M.S. *As Officer (Sister):* Dr. Lucy C. Simpson Davies (since deceased). *As Associate Officer (Sister):* Dr. Parrin Shroff. *As Serving Brothers:* Mr. V. C. J. Harris, Drs. W. W. M. McKinney, J. S. Gray, A. S. Hendrie, M. F. Leslie, E. Smalley, G. Walker, V. Wilkinson, H. J. Henderson, M.C., C. B. Leong, J. B. Mackie, G. L. Gale, J. A. Tomb, P. C. Rayner, J. Cook, G. P. Smith, O.B.E., C. H. Vernon, J. Gourley, G. G. W. Hay, P. T. Davidson, G. S. L. Kemp, D. K. Gaitskell, J. Blyth, A. R. Lester, P. E. Creswell, and D. I. Evans. *As Associate Serving Brothers:* Drs. J. Cohen, P. C. Kwan, and S. S. Ramler. *As Serving Sisters:* Drs. Joan I. Franklin-Adams, Margaret M. Basham, Kathleen E. Slaney, Florence M. Morris, O.B.E., Lai Po-Chuen, Phyllis Haddow, and Sybil K. Batley.

Reports of Societies

MENTAL HEALTH SERVICES UNDER THE NEW ACT

The effect of the National Health Service Act on mental health services was the principal theme of discussion at the twenty-fourth annual meeting of the Mental Hospitals Association, held in the City of London Guildhall on July 15 and 16, and opened by the Lord Mayor. In its report the Executive Committee regretted the passing of visiting committees and the divorce of the domiciliary from the hospital service, but took the view that the Association should do all in its power to assist the Minister to produce an efficient and beneficial service. The fact that the Ministry and the Board of Control had taken the Association into consultation in the preliminary stages was appreciated.

Service for Mental Defectives

Dr. D. H. H. THOMAS, medical superintendent of the Royal Albert Institution, Lancaster, read a paper on mental deficiency services in relation to the Act. He touched also on the extent of mental subnormality as indicated by the estimate of the Board of Education that one child in ten in the elementary schools would require special education on this account. The term, of course, included retardation of potentially normal children by environmental factors; on the other hand, children certified under the Mental Deficiency Acts were not included in this figure. He pointed out that many more defectives were receiving some form of community care than were receiving institutional care. The more than 50,000 under statutory care in the community and the 24,000 under voluntary care would be mainly the responsibility of the local health authorities, leaving some 49,000 in institutions under the Act.

The crucial time for deciding the success of the training of a defective person was at the point when statutory supervision was no longer available—namely, at the time of final discharge from the provisions of the Act. The Board of Control was now asking local authorities to undertake friendly supervision for a year after formal discharge. It was at this time that the social worker was called upon to show the greatest skill in the management of the case, the power of the authority having been withdrawn, and the only link being the esteem of the patient for the social worker. The organization of voluntary mental health work was now extensive and skilful, and he hoped that the fullest use would be made of it. Touching on research, he pleaded for the greatest latitude in the interpretation of what constituted research in relation to mental deficiency.

Mental Health and General Services

Dr. W. MCCARTAN, medical superintendent of Brighton County Borough Mental Hospital, speaking on the integration of mental health services with the general medical services, said it would appear that the inclusion of psychiatric beds in the general (non-teaching as well as teaching) hospitals would go far to ensure such integration. The question arose, however, how far the widespread setting up of psychiatric beds in non-teaching hospitals would cover the needs of short-term psychiatric cases, and how far these would duplicate the provision already made in modern mental hospitals.

"The setting aside of a few wards in the general hospital will not provide a psychiatric department. It may be adequate for the treatment of neuroses, but it would exclude recent and acute cases of psychosis in many of which the prognosis is more favourable than in the milder, though often more intractable, neuroses. It is here that the word 'suitable' in the Nuffield Trust report assumes its importance."[1]

If no provision was made in the general hospital for the recent and acute psychosis patient, mental hospitals must press on with arrangements for their own treatment units, and this might lead to redundancy. The question to be decided by governing bodies was whether it would be best to sponsor psychiatric beds in non-teaching general hospitals or to have units readily available to both general and mental hospitals. The varying needs and special conditions of different areas would determine what arrangements should be made, but whatever scheme was adopted it was to be hoped that provision would be made for neurological and psychiatric collaboration.

Shortage of Mental Nurses

In a paper on present and future trends in psychiatry, with special reference to workers in mental hospitals, Dr. S. W. HARDWICK, medical superintendent, City of London Mental Hospital, said that one of the most pressing problems was the senile patient. It had been said that schizophrenia was the most common among serious psychotic disorders, but he wondered whether mental illness in old age was not more common. The problem was a complex one, because it was not easy to draw a sharp dividing line between the deterioration expected in normal old people and the severer disturbance which amounted to senile dementia. Fortunately the public conscience had recently awakened to the fact that the care and comfort of the aged was the public's own concern and duty. (The report of a Special Committee of the British Medical Association entitled *The Care and Treatment of the Elderly and Infirm*, price 3d., has just been published.)

Dr. Hardwick went on to discuss the nursing shortage, which affected mental hospitals particularly. Intimately connected with this subject was that of nursing training. According to some authorities, notably the Society of Medical Officers of Health, the whole present scheme of training should be altered to afford a shortened practical basic course of two years—the nurse then after examination qualifying as an enrolled nurse—followed by one year's higher training for those wishing to rise to the rank of ward sister in special subjects. Part-time employment had been suggested, but the part-time nurse brought with her a train of difficult problems. It could only be hoped that the shortage of workers would be made good so that an integrated mental health service could go forward.

Dr. Hardwick ended his paper on a warning note. Psychiatry was rapidly advancing and widening its scope, but it was still a youthful science and had not yet got rid of its growing-pains. Its future career was beginning to take shape, but hard work lay ahead and many hurdles had to be overcome. It would be wrong to expect too much in too little time.

[1] The report by the Berks, Bucks, and Oxon Regional Hospitals Council under the Nuffield Trust urges that "all large general hospitals should have a psychiatric department with both in- and out-patient facilities for the diagnosis and treatment of *suitable* [our italics] cases of mental illness in both adults and children."

Correspondence

Metric Equivalents

SIR,—In the course of the session of the Royal Society Empire Scientific Conference, held last July, which was devoted to the consideration of greater uniformity in standards of measurement, the following resolution was adopted:

"If textbooks and scientific data or memoirs are expressed in systems other than the metric, conversion factors or the metric equivalent should be included."

The object which it was intended to achieve by the resolution was to make British scientific papers more intelligible to overseas readers only familiar with the metric system.

We should be grateful if you would arrange to bring this proposal to the attention of your Council in order that consideration may be given to the best means of implementing it. We would suggest that, should your Council or governing body be in general sympathy with the proposal, a meeting of those to whom this letter is addressed, or their representatives, should be called at a convenient date. At such a meeting any special points of difficulty arising could be discussed, and if possible a fairly uniform system worked out which could be recommended to the publishers of journals and textbooks.

We would add that it is intended, as far as possible, to implement the resolution in the reports of D.S.I.R. work published through H.M. Stationery Office either by giving the metric equivalent of data expressed in British units or by the provision of a table of conversion factors. The Royal Society is also proposing to implement the resolution in its own publications. Any correspondence on the subject of this letter should be addressed to the Director, National Physical Laboratory, Teddington, Middlesex.—We are, etc.,

R. ROBINSON,
President, Royal Society.
H. H. DALE,
President, British Association.
E. V. APPLETON,
Secretary,
Department of Scientific and Industrial Research.
C. G. DARWIN,
Director, National Physical Laboratory.
C. C. PATERSON,
Chairman, British Standards Institution Council.

***The metric equivalents of British weights and measures have been included in the *British Medical Journal* since January, 1946, with the object of making "British scientific papers more intelligible to overseas readers only familiar with the metric system." An article entitled "The International System of Weights and Measures," by Dr. J. M. Hamill, was published in the *Journal* of April 5, 1947.—ED., *B.M.J.*

Late Complications of Amoebiasis

SIR,—The interesting paper by Mr. P. Theron (July 26, p. 123) is useful and timely and reminds me of my experience in Mesopotamia during the 1914–18 war and subsequently in surgical practice in the North of England. From those experiences I can confirm most of the points dealt with in the paper, and as surgical history usually repeats itself it will be well to be on the look-out for delayed recrudescences of amoebiasis. I saw several cases where such complications arose a long time after the return to this country of those who had been out East and in some few who had never been out of England. I would like to mention one most striking example, and, though the notes are not to hand, the recollection is so vivid that I can quote the main features without dates and other particulars.

Some months after his return from the East, a man about 28 developed rectal symptoms and signs so suggestive of carcinoma that for a time I concurred in that diagnosis. In the event the condition proved to be dysenteric, and I have to confess that I had previously made a similar mistake in diagnosis in dealing with a soldier in Basrah. As a temporizing measure an inguinal colostomy was made, and it was a rapidly spreading and extensive ulceration, almost like a phagedaena, which attacked the abdominal wall for some inches around the bowel opening which suggested an amoebic origin for the whole trouble.

When injections of emetine were used the ulceration ceased to spread and soon cleared up, as did the rectal amoeboma. Some months later the patient again came under my care, this time with a hepatic abscess, which had to be opened and drained before recovery followed. After a further period of good health lasting for months there were recurrent abdominal symptoms, which cleared up with emetine only to be followed again after a few months with further symptoms of hepatitis. This time the patient became very depressed, refused to come into hospital or be properly treated, and died by his own hand. It will always remain a regret that there was no post-mortem examination.

Such experiences suggest that these late complications mean that the amoebiasis is deeply entrenched and difficult to eradicate. But for immediate improvement and often cure emetine is marvellous, and, though this therapeutic test has always been anathema to laboratory workers, emetine may confer such great benefit that its use should not be unduly delayed in doubtful cases. We always gave 1 gr. of the hydrochloride daily for a week or ten days. The injections were made deeply into the muscle on the outer side of the thigh, and I never saw mischief follow, which is more than can be said for injections into the buttock.—I am, etc.,

Taplow, Bucks. G. GREY TURNER.

The B.M.A. and the Commonwealth and Empire

SIR,—No one who has read Sir Hugh Lett's Presidential Address in the *Journal* of July 26 (p. 121) reviewing the work of the B.M.A. can fail to be impressed by the importance and significance of their new proposals. The establishment of a British Commonwealth Council and of an Empire Medical Advisory Bureau at B.M.A. House, working in close association with London House, is supplying not only a long-felt want but is a courageous act of leadership, interpreting current opinion and anticipating the future needs of the profession throughout the Commonwealth and Empire.

The comparatively small loss of life from wound, infection, accident, and disease during the war has been the outstanding contribution of our combined medical services. There is a strong desire that this "combined operation" should be continued in peace, and this liaison can only be achieved by travel, personal contact, and postgraduate study. As a group of nations we are perhaps too inarticulate to express our appreciation and gratitude to each other by word, but here indeed is a scheme which embodies all these sentiments.—I am, etc.,

London, W.1. L. R. BROSTER.

Limits of Certification

SIR,—Dr. Desmond Curran (Aug. 2, p. 187) is to be congratulated on the stand he has taken. During the latter part of the war I repeatedly called attention to the dangers that would arise if wartime selection methods were to be applied in civilian life. The view that, in the interests of "efficiency," Government departments, educational authorities, and industrial administratives have the right to exploit and, worse still, to place on record psychiatric reports belongs to the totalitarian outlook which, allegedly, we went to war to abolish.

With the actual nature of the clinical tests I am not for the moment concerned, although some of them are absurd enough. The fact is, however, that psychological experts, no doubt smarting from a sense of inferiority and gladdened by the opportunity to display prescience, are apt to forget they are bound by codes of professional discretion which can be abrogated only in the interests of justice and on the instance of a court of law. No doubt lay psychologists are not officially bound by these codes. But we may look forward to the time when they too will recognize their responsibilities in this matter. In the meantime it is to be hoped that medical psychologists will support the stand Dr. Curran has taken. It is perhaps inevitable that the post-war period should prove to be a "silly season" for psychology: but the shorter the season the better for all concerned.—I am, etc.,

London, W.1. EDWARD GLOVER.

Temporal or Giant-cell Arteritis

SIR,—In his excellent article on temporal arteritis Dr. Kenneth Robertson suggests (Aug. 2, p. 168) that reports of this condition should be made as cases appear. Since my attention was drawn to it in the *Medical Annual* of 1942 I have had at least five cases confirmed by biopsy, two of which have been shown at local B.M.A. meetings, and as I have been told of other cases recognized by local general practitioners the condition is not very uncommon. The sex incidence of my cases is unusual, four being males. All have been 60 or above. In one rheumatoid arthritis was associated, and in one prostatic carcinoma. Blood changes, fever, malaise, and depression were not characteristic, and it seems clear that diagnosis depends on biopsy of the temporal arteries. There was a remarkably similar look about my patients, with skin drawn tightly over prominent bony cranial ridges, so that in clinical photographs the sometimes duskily red temporal vessels were easily demonstrated. Headache in four cases was severe, worse on pressure, temporal or bitemporal, and not associated with vomiting. I was not able to assure myself of peripheral vascular disease other than what might be expected in this age group, and, as all survived, had no post-mortem opportunity. In two there was evidence of intracranial involvement—one the case where headache was not prominent but where a confusional state was associated with paresis of the lower limbs, and one where, following some months of severe headache, there was rapidly developing blindness on the side of the affected temporal vessel, with evidence of retinal artery thrombosis. Biopsy appeared to hasten relief from headache, but had no specific effect on those with intracranial lesion, though freedom from pain and the provision of a definite diagnosis and relatively cheerful prognosis had probably some effect on one of them.

Excision of part of the vessel is not troublesome, as the lumen is practically occluded. For this reason I do not hesitate over biopsy as treatment, though in future I shall certainly consider anticoagulants. Differential diagnoses which arose were temporo-mandibular arthritis, cerebral tumour, and arteriosclerosis with cerebral thrombosis and degeneration. If the existence of temporal arteritis is remembered, however, diagnosis has seemed straightforward, and, especially since the work of Cooke and others, the interest has seemed to lie in its causes, general and local, why the arterial tree becomes diseased at all, and why the temporal arteries should so often be the branches first affected. I have no suggestion about the general cause, but locally would point out that the temporal vessels run over bony ridges in close relation to joints, muscles, and fasciae in constant movement, exposed to "micro-trauma" from hat-brims, spectacles, and pillows, and only protected from such and from temperature change by a thin layer of skin.

At the Royal Sussex County Hospital we are planning investigation into temporal artery histology in the aged compared with that of less exposed vessels more inured to physical stresses and strains. But as a clinically diagnosable condition temporal arteritis seems simple if remembered.—I am, etc.,

Hove, Sussex. W. A. BOURNE.

Salaries of Specialists in N.H.S.

SIR,—We all naturally see this matter of specialization most easily from our own particular angle, and so I naturally feel no difficulty in agreeing with Dr. Clifford Allen (Aug. 2, p. 189) when he feels "that the M.D. and M.R.C.P. should be considered equal to the M.S. and F.R.C.S." But it is not less easy to agree with him when he says that "if a D.P.M. is appended to the medical degrees it should not lead to a poorer remuneration." The medical degrees (presumably the M.D. and M.R.C.P.) imply that their holder has a good general grasp of medicine and so a more proportionate view of his own special branch of it.

But the question will arise as to whether those who have none of the higher degrees just mentioned, but simply hold a diploma such as the D.L.O. or the D.C.H., should be ranked equally with those who also hold the F.R.C.S. or M.R.C.P. It seems to me that there are difficulties here and that the varying stature of the many diplomas is to blame. For example, the D.A., to which Dr. Allen refers, is the main higher qualification in a rather isolated branch of medicine; but the D.R.C.O.G. ranks well below the M.R.C.O.G., the recognized specialist qualification in another well-defined branch. Surely the time for a country-wide standardization of medical degrees and qualifications is more than overdue.—I am, etc.,

Edgware, Middlesex. G. H. JENNINGS.

SIR,—I should like to endorse whole-heartedly the argument briefly but effectively outlined by Dr. Clifford Allen in his letter (Aug. 2, p. 189). The instance he cites of a salary scale offered to "specialists in nervous and mental diseases" (I quote the words of the advertisement to which he refers) comparing unfavourably with that offered to general physicians and surgeons is unfortunately not confined to the Iraqi Government. A county council with a deserved reputation for being less parsimonious than most to their whole-time specialists recently displayed similar discrimination in their advertisement in the *B.M.J.*

It cannot surely be seriously disputed that possession of the same or equivalent higher qualifications and experience in any field of medicine or surgery should carry the same remuneration in a salaried service, whatever the basis of that service. Any departure from this principle invites the dangers of neglect of the financially depreciated specialty mentioned by Dr. Allen; but even were the basis of discriminatory remuneration to be accepted—which, I repeat, I regard as indefensible—the specialist in psychological medicine could claim that his own branch demanded one of the highest rates of all by virtue both of its sociological importance and the statistical proportion among sick people of the problems with which it deals. Whence then arises this tendency to financial undervaluation of these appointments? Whilst emphatically agreeing that any such tendency must be entirely excluded from a National Health Service, an understanding of one possible explanation for its continued existence may help in removing it.

Governments, governing bodies, and appointment committees in general tend all too often to be well in the rearguard of contemporary medical thought and values. To them the psychiatric specialty may still predominantly suggest a conception which was for so long responsible for the Cinderella status of the mental health services, whereby the D.P.M. became the touchstone, and apprenticeship in mental hospitals begun almost immediately after qualification effectively prevented all but the distinguished few from obtaining higher qualifications in general medicine. One effect of this conception has been that among candidates for specialist appointments, whereas the general physician had to have his M.D. or M.R.C.P. and the surgeon his F.R.C.S., the psychiatrist, whatever his other merits or experience, might have simply a D.P.M., which is of course not a higher qualification at all. The fact that this conception is no longer true does not, unfortunately, prevent its implications from influencing those at present responsible for offering appointments and deciding salary scales.

The conclusion to be drawn is either that these bodies have yet to discover (or refuse to believe) that first-class men are available for their appointments in psychological medicine—or that, for reasons of economy or prejudice, they don't want them even if they are. One thing is, however, quite certain: they will not in fact attract such men until they demonstrate effectively their recognition of the standard required and the status implied by that standard, of which remuneration equal to that offered to other branches is simply one indication, albeit a significant one.—I am, etc.,

Bognor Regis, Sussex. DAVID STAFFORD CLARK.

Working Hours in N.H.S.

SIR,—May I support Dr. P. B. Atkinson's letter (Aug. 2, p. 190)? The matters he suggests in para. 3—e.g., 28 days' leave, every other week-end off, no patient seen after 6 p.m.—are principles which would unite G.P.s together far more than the controversial one of sale of practices, which many of us think is as out of date as buying Army commissions and as immoral as simony. How comes it that the A.R.M. has just rejected these points (vide *Supplement*, Aug. 2)? No wonder you report (p. 178): "It soon became clear that medical men . . . especially those in general practice, are . . . uneasy about the present . . . situation."—I am, etc.,

Lincoln. G. D. SUMMERS.

State Medical Service

SIR,—It is, I think, high time that we were told of the negotiations at present going on between the B.M.A. and the Government. What are the conditions? What is to happen to existing stocks of drugs, dressings, etc.?

If the practitioner is to become a State servant, will he be granted an allowance for car and running expenses? What remuneration is to be paid to his wife for her many services to the practice?—I am, etc.,

Acocks Green, Birmingham. G. A. POWELL-TUCK.

Treatment of Acute Mastitis

SIR,—I was interested to read the two letters on the treatment of acute mastitis by Dr. J. MacLeod (June 14, p. 865) and Dr. R. Marcus (July 5, p. 30). In 1945–6 I treated a series of cases with penicillin (12,500 units 3-hourly intramuscularly). All cases received sulphathiazole, and their abscesses were incised, while alternate cases received penicillin as well. The average length of stay in hospital of the controls was compared with that of some 350 cases similarly treated in the previous two years, and was almost identical—and therefore presumed to be an accurate standard.

Clinically those receiving penicillin recovered more quickly and with less interference with function and a better cosmetic result, but it could not be proved statistically. This appeared to be due to a difficulty in classifying the severity of the infection and an insufficient number of cases receiving penicillin. The simple well-localized abscess is cured quickly by any of the well-recognized treatments. The difficult case is the one where there is a homogeneous induration of one or more quadrants, and fortunately this is just the case which does well on penicillin. A radial incision to evacuate pus was used in my series, healing readily and not requiring either frequent dressings or secondary suture.

I agree with Dr. Marcus that stilboestrol is not necessary, as these cases are not hindered by lactation unless the infection is severe, when it is best to have an inactive breast. Hexoestrol dipropionate then appears to be more useful than stilboestrol. It therefore seems necessary to have a standard classification of the type and severity of the infection before any assessment can be made of the efficacy of any one line of treatment.—I am, etc.,

B.A.O.R. A. FURBER MURPHY, Lieut., R.A.M.C.

Complete Removal of Prostate

SIR,—I was interested to read Mr. H. S. Souttar's article (June 28, p. 917) on complete removal of the prostate, in which he states that it will be generally agreed that the extravesical approach to the prostate "introduced" by Mr. Millin presents considerable advantages over the older transvesical methods. As Mr. Souttar seems to think that the prevesical or retropubic approach is something new I should like to point out that it has been used off and on for 41 years. It was employed in 1906 by Zuckerkandl, in 1909 by Van Stockum, in 1922 by Lidski, and in 1933 by Jacobs and Casper.

There seems now to be not only a yearly but a monthly increase in the number of techniques for prostatectomy, and in spite of this wide variety Mr. Souttar appears to have incorporated some novel ideas into his method. Consequently I am in absolute agreement with Mr. W. W. Galbraith (July 26, p. 150) in stating that many surgeons lacking a thorough knowledge of prostatic surgery might be led to try Mr. Souttar's operation with results which might be disastrous to the patient.—I am, etc.,

London, W.1. W. K. IRWIN.

Antacids for Peptic Ulcer

SIR,—Dr. A. H. Douthwaite, in his paper "Choice of Drugs in the Treatment of Duodenal Ulcer" (July 12, p. 43), describes under the heading "Antacids" the neutralizing action of various chemical agents by plotting the free hydrochloric acid titration values according to the usual fractional test-meal procedure.

While this is a good diagnostic method for a variety of conditions, we would suggest that, for the purpose under discussion, a *p*H scale instead of acid titration values and a meal approximating more closely to the average diet of the peptic-ulcer case would provide a sounder basis physiologically and be of greater clinical significance. Such modifications, we suggest, might well give a closer correlation between the experimental tests and the present-day therapeutic evaluation of antacids than that shown by Dr. Douthwaite.

These comments are not intended to detract from the importance of Dr. Douthwaite's main thesis, namely, the relationship of ulcer pain to hypermotility, but the sound development of chemical antacids would seem to be of sufficient importance in the control of acidity and pepsin activity (the latter factor was not mentioned by Dr. Douthwaite) to justify some consideration of what we consider to be a weakness in the present experimental position.—I am, etc.,

The Crookes Laboratories, Limited, London, N.W.10. E. W. GODDING.

New Theory of Jaundice

SIR,—In the *Journal* of May 31, Dr. Paul Fourman reviews (p. 766) under the above heading the book of I. Pavel, of Bucharest. I was very interested to read about the theory of spasm of the sphincter of Oddi, which is said to be brought about by emotional and nervous factors. A similar suggestion was made in Nairobi in 1944 by Dr. Jules de Mello, who described jaundice among Goans as caused by spasm of the biliary passages just as the spasms of the bronchioles in asthma. A curious method of treatment by branding among these Goans was described, which suggested the possibility of the spasm theory.—I am, etc.,

Nairobi. A. R. DHANJI.

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Burn Toxaemia Treated by Rapid Venesection and Transfusion

SIR,—Corporal X. Y., Nottinghamshire Yeomanry, was accidentally burned by petrol on June 23, 1942. He was evacuated by air 48 hours afterwards. He was delirious on arrival and his pulse was difficult to count. The haemoglobin was 125%. There were deep and extensive burns of both legs and both forearms. He improved after saline and plasma infusion but relapsed three days later; this time he did not respond to further infusions. His condition became gradually worse. Vomiting was frequent and hiccough persistent. His face was an ominous greyish-blue colour and he had a running pulse. From previous and bitter experience it was considered that he would not live much longer than 24 hours unless something drastic happened.

Venesection and transfusion were therefore undertaken. A cannula was tied into the right median basilic vein and a little saline run through it. A pint of fresh cross-matched blood of the same group and three pints of stored blood were near the bedside. Venesection was then started from the left median basilic vein, and while this was going on the pint of fresh blood was transfused slowly on the opposite side. After 3½ pints of blood had been withdrawn rapidly by the venesection the patient collapsed suddenly, air hunger ensued, and he became almost pulseless. Prompt resuscitation was required. The foot of the bed was raised on chairs and the transfusion speed was increased to its maximum and oxygen administered. The patient rallied. Next morning he was sitting up in bed and enjoying his breakfast; his colour was much improved. Vomiting and hiccough never recurred and his subsequent progress was uneventful.

After two skin-grafting operations had been performed his wounds healed and he was evacuated to the U.K. At the time we thought the venesection had been too rapid, but to have drastic effect and to avoid dilution of toxins when transfusion is also occurring rapid and large-volume venesection is necessary. On this occasion air hunger and collapse ensued with such little warning that the precaution of inserting the large cannula for transfusion before starting the venesection was invaluable. No conclusion can be drawn from the treatment of a single patient, but the effect was suggestive enough to warrant further trial in the advanced stages of "toxaemia of burns." We do not think that it is indicated in the more common type of extremely ill burn patient who in a later stage is suffering from septic absorption from infected raw areas.—I am, etc.,

Leeds. MICHAEL C. OLDFIELD.

Treatment of Abortion

Sir,—Dr. J. McD. Corston and Mr. John Stallworthy (July 19, p. 89) are to be congratulated on the low mortality of 0.17% in their series of 600 abortions treated by surgical evacuation of the uterus. Their results at least question the validity of the generalization that the mortality among cases of abortion treated actively is twice that among those treated conservatively. Studdiford (1939), not using chemotherapy, did not find any significant difference between the results in 1,248 cases treated actively from 1934 to 1937 and those of a control series of 7,184 cases treated conservatively from 1920–33.

In the North Middlesex County Hospital surgical evacuation of the uterus is the general rule. But in frankly septic cases not manifesting general peritonitis necessitating immediate laparotomy one of two courses is followed, depending upon the clinician in charge. In each a vaginal swab is taken for culture. Thereafter the uterus is evacuated immediately, drainage is established by a catheter, through which glycerin is introduced by a modified Hobbs' (1927) technique, and chemotherapy given as indicated by the bacteriological findings. Or a sulphonamide is administered and evacuation is postponed until the bacteriological report is available, when if haemolytic streptococci are present evacuation is not undertaken until the temperature has been normal for three or four days, while in the absence of haemolytic streptococci evacuation may be undertaken in febrile patients but is frequently postponed until the patient is afebrile.

In 1945 the M.R.C. Classification of Diseases was adopted in the hospital. Our abortion figures for that year (those for 1946 are not yet available) are comparable to those of the Oxford writers. Threatened, spontaneous complete, missed abortions, and one incomplete abortion in which the uterus was not evacuated (*vide infra*) have been excluded. During the year 480 cases of inevitable, incomplete, and septic abortions were treated along the lines indicated. In addition, five of them had laparotomy performed because of peritonitis. One patient died—a mortality of 0.2%.

Fatal case.—Progressed satisfactorily for four days after evacuation of uterus, when vomiting, accompanied by renal tenderness, set in followed by oliguria, drowsiness, coma, and death nine days after operation. Before admission had visited an abortionist on six occasions. P.M. (coroner) oedema of the brain and subacute nephritis.

Among the cases *excluded*, as indicated, two patients died. Brief details of these are given lest it should be thought that the selection in the cases presented has been prejudiced. In neither case was there operative interference.

(*a*) Primigravida, aged 20, admitted with auricular fibrillation when 20 weeks pregnant. Spontaneous complete abortion. Steady deterioration. Died ten days later.

(*b*) Primigravida, aged 35, admitted moribund from septicaemia. Aborted foetus but not placenta. No haemorrhage. Died six hours after admission. *Cl. welchii* in blood culture and in foetal tissues.

Prompt evacuation of the uterus is certainly more convenient for the patient. It ensures that the abortion is completed. It shortens her immediate illness and stay in hospital. Perhaps larger series will be published showing the results obtained under modern conditions. But if conservative treatment proves to be significantly safer, then many more hospital beds for the treatment of abortion will be required.

Unlike the authors I do not operate early on patients with severe haemorrhage. Ergometrine 0.5 mg. is given intramuscularly to arrest it, and repeated in one hour, two hours, and four-hourly during the period of resuscitation. Only exceptionally is the immediate additional removal of a piece of tissue from the cervical canal required. In the exsanguinated patient morphine gr. ¼ (16 mg.) and the first dose of ergometrine are given intravenously *consecutively*—this prevents the vomiting sometimes caused by the intravenous oxytocic. The haemorrhage arrested, she is rendered fit by blood transfusion for deliberate evacuation of the uterus.

Packing of the uterus I find almost unnecessary. Haemorrhage at evacuation is due to trauma which is preventable or can be controlled by sutures, incomplete evacuation of the uterine contents for which the remedy is obvious, or atony of the uterus. This last can be overcome by the avoidance of deep ether anaesthesia, by bimanual compression, or the use of an oxytocic. For rapid action of the oxytocic I usually have the anaesthetist give it intravenously during the evacuation. I should like to endorse the authors' closing statement that routine treatment is easy to prescribe, but on the nice decision of when to administer it may hang the balance between life and death. —I am, etc.,

London, N.18. Anthony W. Purdie.

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Premature Birth at Sea

Sir,—While I was acting as a ship's surgeon in 1946 a premature baby weighing only 2 lb. 7 oz. (1.1 kg.) was born at sea and has survived. Is this a record for the survival of an infant of this size born under these circumstances?

The mother was a primipara, aged 28, who had been married nearly seven years. In 1944 she had a dilatation and curettage, and later that year a cyst was removed from the left ovary and at the same time a round ligament suspension operation was performed. At this operation it was noticed that the right ovary was represented by a rudimentary seed, and the right tube was congenitally absent. The remaining portion of the left ovary, after the cyst had been removed, was quite healthy. She became pregnant in 1946, and decided to return home to England from Australia.

When first seen on the ship on July 6, 1946, when her membranes ruptured, she stated that her L.M.P. was on Dec. 2, 1945. The patient commenced good labour pains on July 10, and during the evening of the next day was delivered of a live and fully developed baby girl weighing 2 lb. 7 oz.

At this time the ship was passing through the Indian Ocean, and the temperature in the ship's hospital was 96° F. (35.6° C.). The baby was wrapped in cotton-wool and placed in a cot. It was given 1 drachm (3.5 ml.) of diluted breast milk by pipette every two hours for the first 6 days; this quantity was then increased from 2½ dr. (8.5 ml.) to 5 dr. (17.5 ml.) every two hours during the next 12 days. On the nineteenth day the baby could suck well and was given bottle feeds every three hours. For the first week of life the baby became very blue during feeds and caused some anxiety, but it quickly recovered on the administration of oxygen.

A letter received from the parents in January, 1947, stated the baby weighed over 15 lb. (6.8 kg.) and was progressing satisfactorily.—I am, etc.,

London, S.W.12. D. E. Hayes.

The Coroner's Court

Sir,—We have read with some interest and much perturbation the procedure of the coroner's court in the case of Dr. Clements, etc. We were under the impression that the duty of the coroner's court was to certify the cause of death only and not to try persons or pass a verdict as to their guilt.

Had Dr. Clements been alive he would have been condemned by this coroner's court, then been tried in court (which would have been biased against him by the verdict of the coroner's court), and then, thirdly, have to stand for trial again at the Old Bailey. Surely some mistake has occurred in this case—perhaps it is a sign of the times.—I am, etc.,

London, S.E.9. B. N. Blood.

*** Our Medico-legal Correspondent writes: There was nothing new or improper in the procedure of the coroner's court in the Clements case. From time immemorial the coroner's jury has found named persons guilty of causing the death of the deceased. In fact, if they are to declare the cause of death it would be rather illogical to expect them not to do so. When a jury finds that a named person murdered the deceased or was guilty of his manslaughter, the coroner issues a warrant for the arrest of the person and, since the Act of 1926, commits him for trial as though he had been examined before magistrates. He is therefore not tried again until he comes up to assizes; in fact, it is wrong to speak of the coroner's court "trying" him at all. Their finding is merely an expression of opinion incidental to their verdict on the cause of death, and biases the assize jury no more than would the order of justices committing him for trial.

Actinomycosis of Rectum and Anus

SIR,—In connexion with an investigation which I am making into the incidence and symptomatology of actinomycosis involving the rectum and anus, I should be greatly obliged if any of your readers would let me have details of any such cases which may have come under their observation.—I am, etc.,

London, N.W.3. V. ZACHARY COPE.

Rutin in Capillary Fragility

SIR,—The annotation entitled "Rutin in Capillary Fragility" (May 31, p. 771) is in our view too committal on several points as yet *sub judice* and is incorrect on a number of others.

The name "citrin" has been, and still is, applied by many writers indiscriminately to concentrates, of various origin, that may or may not have been made precisely according to the method described by Szent-Györgyi in 1936. All these concentrates, however, seem, in so far as their physical properties have been described, to be water-soluble and relatively stable in aqueous solution. How "citrin" can possibly contain appreciable quantities of hesperidin, a glycoside of hesperetin (and therefore a derivative of flavanone—not flavone) and virtually insoluble in water, was never explained by Szent-Györgyi when he suggested that his citrin might be a mixture of hesperidin and its desmethyl compound, called by him "eriodictin" (*not* eriodictyol, an aglycone, already well known to occur in yerba santa and other plant materials). Unfortunately in the same paper Szent-Györgyi referred both to eriodictin and to eriodictyd, admitting subsequently (private communication) that the latter word was due to a printer's error! This did not help to lessen the confusion.

Two other workers have reported the isolation from "citrin" of eriodictyol glycosides and the preparation from them of eriodictyol by hydrolysis. It has been stated that these materials, though water-soluble, have no effect on capillary fragility. If either of these glycosides is Szent-Györgyi's hypothetical eriodictin, its water-solubility is difficult to understand; it would mean that replacement in the fairly complex hesperidin molecule of one methoxy group by a hydroxy group causes a virtually insoluble substance to become extremely soluble in water. We also find it difficult to credit the claim that insoluble hesperidin has been isolated from the soluble "citrin." As to the alleged inability of hesperidin to raise capillary resistance, we can only call attention to our published work, which seems unknown to the writer of your annotation: separately we have reported on many occasions that hesperidin, after repeated recrystallization from boiling methanol and probably rendered thereby more nearly pure than any other specimens examined, exhibits marked vitamin-P activity both on experimentally depleted guinea-pigs (A. L. B.) and on patients (H. S.) with low capillary resistance not raised by pure ascorbic acid alone.

Part of the discrepancy in experimental findings is no doubt due to the different origins and treatments of the materials tested and to the absence of any standard preparation or generally accepted technique for the biological test. It has also been suggested that the chalcone of hesperidin (with the oxygen ring opened) may be the active form and, owing to its relative instability, present in small quantities in apparently pure hesperidin, of which it is a tautomer. Californian investigators have claimed vitamin-P activity for the methyl ether of this chalcone, and a much increased stability, but the only material so described and examined by us did not appear to be of the claimed chemical composition. On the other hand, the work of Parrot and his colleagues in Paris with mixtures of isomeric epicatechins suggests that one of these isomers may be a highly potent form of the vitamin, perhaps responsible in traces for the activity of other less potent and apparently pure compounds.

However that may be, our own tests do not substantiate the claim that rutin—a derivative of flavonol, not flavone—has marked activity in the treatment of nutritional vitamin-P deficiency. Preliminary experiments on guinea-pigs and human subjects indicate that its activity is no greater than, and may indeed be only about half that of, hesperidin. Moreover, neither of the two samples received by us from the U.S.A. appears to be a single pure compound: both are pale greyish-green powders, from which pale yellowish crystalline material can be separated by recrystallization. Of these two specimens, one was found to have a melting-point of 191° to 191.5° C., the other of 186° to 188° C. Even if the former is pure (which we do not believe), the latter cannot be.

Admittedly the whole of this confused position could not be clarified in a short annotation, still less in a letter, but we cannot accept your claim that "probably the active substance is rutin" without careful scrutiny of the evidence in favour of hesperidin chalcone and its methyl derivative or, more recently and more convincingly, of certain epicatechin isomers by Parrot and his colleagues. On chemical and biochemical grounds, therefore, we maintain that your conclusion as to the activity of rutin and the nature of vitamin P cannot be substantiated. Equally potent criticisms may be levelled at your assessment of its clinical uses.

Although we have confirmed the observation that a certain proportion of cases of hypertension have a significantly low capillary resistance, and also that the proportion of patients with retinal haemorrhage is significantly greater among those with low capillary resistance, we have no evidence to suggest that these phenomena are aetiologically related. As to the action of rutin in increasing the capillary resistance of hypertensive patients, our experience is that either an enormous quantity or very prolonged administration is necessary before any demonstrable effect is obtained. We have, in fact, not yet succeeded in restoring to normal levels the low capillary resistance in any hypertensive patient by means of rutin. Until much more information is available we feel that your statement that the most important purpose for which rutin may be given is "to prevent haemorrhage in patients with hypertension" is liable to give a false impression.—We are, etc.,

A. L. BACHARACH.
H. SCARBOROUGH.

Spinal Pumping

SIR,—Before the iron curtain clanged down A. D. Speransky was successful in publishing an account of the researches of his group in English. *A Basis for the Theory of Medicine* was published in New York in 1935. Here the reasons for his belief that the nervous system plays an important part in the genesis of acute and chronic illnesses are expounded. I have summarized his hypotheses in two papers published in this country—"Recent Researches in the U.S.S.R.," *Bristol med.-chir. J.*; "Constitution and Chronic Disease," *Brit. homoeop. J.*, 1939, **29**, 224. Moreover, many of the experiments which formed the basis of his theories have been published in French and German journals, and a long bibliography at the end of his book indicates some of the sources.

Briefly put, Russian studies of the circulation of the blood and C.S.F. in the medulla, subarachnoid spaces, and spinal nerve sheaths gave rise to a number of new working hypotheses for investigating the role of the nervous system in pathological processes. The passage of antibodies through the blood-stream barrier was studied in experimental rabies by Ponomareff, A., and Tchechkoff, A. (*C. r. Soc. Biol.*, Paris, 1927, **97**, 376), and Jowelew, B. M. (*Z. ges. exper. Med.*, 1930, **74**, 217) and it was in this research that the technique of pumping or "pompage" to break down the blood-stream barrier and increase the permeability of the vessels of that barrier was devised. It was claimed that the antitoxins of diphtheria, tetanus, and dysentery could be made to pass through the hitherto impermeable barrier by this method.

The technique was first applied to human beings in cases of meningitis, where in six cases extraction and reintroduction of 10 ml. of C.S.F., repeated five to eight times, had dramatic results. A seventh case ended in a death, and the technique was abandoned temporarily as the "pompage" could not be altogether absolved. It was introduced again in the treatment of acute rheumatic fever with the idea that the salicylates could be brought into closer contact with the nervous system, and Gorschkow, M. A., and Babkowa, A. A., published their results (*Z. ges. exper. Med.*, 1929, **67**, 278). After the exhibition of salicylates 10 ml. of C.S.F. was withdrawn and reintroduced eight to forty times. 70% cures were claimed in first attacks and over 70% cures in cases where the attack was the second or third one. Later, "pompage" was used without any salicylates, and though the results were not so striking good effects were obtained.

Speransky also noticed that after "pompage" there was sometimes a dissociation of the rheumatic fever syndrome: sometimes the temperature fell but the joints remained swollen for some days; or alternatively the pyrexia was maintained for some days but the swelling and pain in the joints rapidly disappeared. He argued from his study of trophic disorders that the rheumatic process was a specific nervous dystrophy, and that it was not necessarily the increased accessibility of the salicylates provided by the pumping that was remedial, but that the pumping itself was a nervous "stimulus" that provoked a new set of reactions in the nervous system which could abolish the pattern set up by the rheumatic process. Pumping, therefore, is a non-specific method of interference, and Speransky's team claimed good results in typhus and malaria. But Speransky gives the warning that pumping is a trauma of the nervous system, and if it is not followed by a reaction specifically useful it will inevitably make the position worse.

The Gillmans are to be congratulated on their enterprise in clinically confirming the results claimed by the Russian workers.—I am, etc.,

Bristol. FRANK BODMAN.

Iodine and Failing Lactation

SIR,—With reference to the article by Dr. Margaret Robinson on "Iodine and Failing Lactation" (July 26, p. 126), you may be interested to hear that my late respected kinsman William Bennett, of Otley, was 70 years ago prescribing iodine for the last three months of pregnancy and the first three months of the puerperium as a routine measure. His instructions were: "Take two drops of Lugol's iodine (freshly made) upon a lump of sugar dissolved in milk each morning throughout the 7th month; four drops in the 8th month; and six drops in the 9th month; repeat the six drops for the next three months." He insisted that the increase of dosage should be made when the moon was at full. For the pernicious vomiting of pregnancy he gave tinct. iodi mitis, 2 min. (0.12 ml.), in aired water, fasting.

When busily engaged in practice he attended a maximum of 280 confinements per annum. He was in active practice over 32 years, and in the extreme of age I have frequently heard him state that where his instructions had been followed no mother was without milk and no vomiting was uncontrolled. I personally have followed his treatment with similar results for the last 25 years. It is interesting to have specialist if not consultant approval, albeit belatedly, for this treatment. Has any work been done upon the connexion between pernicious vomiting, failure of lactation, and "pining areas for cattle and sheep"?—I am, etc.,

Leeds. JAMES E. OUTHWAITE.

Standard of Nursing in the U.K.

SIR,—The letter from the Registrar of the General Nursing Council for England and Wales (July 26, p. 149) deals with a matter which is always of importance but perhaps especially so at the present time, when the shortage of nurses is being so severely felt by all classes of hospitals and allied institutions. The Registrar refers to the fact that the G.N.C. is being pressed from certain quarters to a lowering of its standards of training, and points to the fact that nursing education standards here would already appear to be falling below those in the Dominions.

Is it permissible to suggest that the pressure on the G.N.C. comes from experienced and responsible sources, and that those responsible for British nursing standards would be well advised to pay heed to it rather than to raise further the standards of theoretical nursing education in this country?—I am, etc.,

Inverness. T. C. MACKENZIE.

Report of B.M.A. Film Committee

SIR,—It is distressing that the Report of the B.M.A. Film Committee (Appendix II, Supplementary Report of Council, *Supplement*, June 21, p. 140) should have evoked neither appreciative nor critical comment in your columns. I must confess that, not being an avid reader of the *Supplement*, the Report at first escaped my attention, and with this in view one must earnestly hope that its relegation to the last few pages of the *Journal* did not impede its potential circulation. Further, its length is of such proportion as might engender timidity on the part of a non-technical reader. Patient reading, however, dispels this notion, and student and teacher alike will find it of interest if not of value also. Surely the committee is to be commended on the publication of this document, for though many fragments of it have appeared before and separately, the collation of such material at a time when medical schools are still busy endeavouring to formulate their own ideas on the subject must be beset with difficulties.

The inclusion of a short section on the film strip (paras. 26–33) is indeed interesting and encouraging, though by virtue of loose definitions and important omissions this part of the Report lacks the necessary conviction. For instance, no mention is made of the fact that such strips are customarily prepared on non-inflammable film of 35-mm. gauge and that (at present) two frame sizes are available. Reference to one of the more important features of film strip has only been made in the most nebulous manner: it should be understood that the scripting and construction of a first-class strip is not at all unlike that of a motion picture. Hence, in the many cases where the demonstration of movement is non-essential, the former medium may be used with even greater efficiency than the latter and at a fraction of the production cost. Points concerning the production of recapitulatory film strips from selected frames of motion pictures need not be laboured here, but a section of film strip should not be complete without some allusion to the miniature lantern slide, without which there is a danger of imposing an unnecessary limitation on the versatility of the medium as a whole.

No doubt the above points would have been covered by a more complete survey, but as, in the words of the Report (para. 31), "Films and film strips are probably the most closely related visual aids . . ." it seems important that a clear conception of the inter-relationships involved should be presented. Together with the Scientific Film Association's Film List this Report must form a valuable guide to present trends, and should stimulate those of us who are even remotely connected with the preparation and use of visual aids.—I am, etc.,

Department of Medical Photography, Westminster Hospital. PETER HANSELL.

POINTS FROM LETTERS

Request from Finland

Dr. F. CHOWN (Penzance, Cornwall) writes: I have received a letter from a Finnish doctor—Dr. Reino Lagus, Pettosalmi—to say that he is likely to attend the International Congress for Mental Health, to be held in London in August, 1948, and in order to solve the difficulty of getting foreign currency he is willing to receive an English doctor, or member of his family, as a guest in his house for a month either this summer or at the beginning of next summer, if he in exchange will help Dr. Lagus in his stay in England. Dr. Lagus speaks English. The address is: Dr. R. Lagus, Arhadia, 31, A 23, Helsinki, L., Finland.

Warmth and Colour

Prof. W. BURRIDGE (Oxford) writes: . . . I have to suggest . . . that no explanation of colour vision can be held satisfactory if it neglects the artists. They are the scientists of colour sensing, and we should grant them the credit of being as correct in their judgments as we are in our own. That is to say, a satisfactory colour vision theory must make automatic provision for a division of colours into the warm, cold, and neutral as well as for yellow to be perceived as warmer than red. Up to the present, however, the physiologists and psychologists have assumed that the artists have made an awful mistake in sensing yellow as warmer than red. They have consequently framed theories to accord with the assumption that the artists are wrong. But if the artists were right there must be something fundamentally wrong with the assumption. It is also agreed among writers of textbooks on vision that no satisfactory explanation was known to them of the production of colours by Benham's top. This question was taken up in India by Dr. Naidu, of Annamalai University. He found a very simple explanation of the production of colours by Benham's top. In fact, by accepting a different basis for the fundamental action of light on the eye, colour production by Benham's top became a predictable phenomenon. Colour production by Benham's top accords with the artists' division of colours as well as with the sensing of greater warmth in yellow than in red.

Obituary

J. SCOULER BUCHANAN, M.B., F.R.F.P.S.

Mr. J. Scouler Buchanan died suddenly on July 23 at the age of 56. He was present at the July meeting in Oxford of the Association of Surgeons of Great Britain and Ireland, apparently in his usual good health. On his return to Glasgow he developed a mild coronary attack, which was followed in only two weeks by a fatal recurrence. His place in the Western Infirmary, where he was on the honorary staff for nearly thirty years, will be difficult to fill. A son of the late Dr. John A. Buchanan, of Rutherglen, he qualified M.B., Ch.B. at Glasgow in 1912 and served for a year and a half as house-surgeon and house-physician in the Western Infirmary. Having decided on a surgical career, his next step, so seldom taken now though still often advocated, was to spend some months in general practice. On the outbreak of war Buchanan joined the R.A.M.C. He was in France and Belgium from the autumn of 1914 and, apart from a short period at home during 1915, served continuously in France till 1918, latterly as a surgical specialist. At the end of the war he was transferred to Glasgow as orthopaedic surgeon to the Bellahouston Red Cross Hospital. In 1919 he was elected to the staff of the Western Infirmary, where he joined the clinic of the late Mr. Archibald Young. In 1925 the death of Sir William Macewen led to Young's promotion to the regius chair of surgery and Buchanan became his university assistant. A few years later he became senior assistant to the late Mr. Farquhar Macrae in the Western Infirmary and, after Macrae's retiral, held a similar position with Mr. W. A. Campbell. In 1936 he was promoted visiting surgeon and two years later became hon. lecturer in surgery to the University of Glasgow. Thus throughout his professional career he held appointments in the Western Infirmary, but in his younger days he had also been for ten years an assistant surgeon to the Royal Hospital for Sick Children, and for the last seventeen years he had been consulting surgeon to Ayr County Hospital. He was a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, and after serving for several years on the council he was elected Visitor in 1946. In the same year he was elected to the council of the Association of Surgeons of Great Britain and Ireland. He did more than his share of public work, and at the time of his death was a member of the boards of management of the Western Infirmary and of the Royal Maternity Hospital, and was chairman of the advisory committee of the staff of the Western Infirmary. He was a good committee-man and his advice was highly valued by his lay and medical colleagues.

W. W. G. writes: Buchanan excelled as a general surgeon and had an extensive private consulting surgical practice. Patients trusted him without reservation, for here, they knew, was a man full of human sympathy yet master of the situation. He was thorough in the pursuit of an accurate pre-operative diagnosis and, having taken his decision, a bold operator. He taught and practised meticulous pre- and post-operative treatment and he was rewarded by brilliant results in the most diverse fields of surgery. Indeed the writer regarded him as one of the few remaining great general surgeons. As a teacher Buchanan achieved outstanding success. He had an inquiring and critical mind and an extensive knowledge of surgical literature; he prepared carefully; he delighted in the giving of instruction and he understood the students and their difficulties. With undergraduates and postgraduates alike he was one of the most popular surgical teachers in the West of Scotland. He served for a term of years as examiner in surgery to the University of Glasgow and as examiner for the Fellowship of the Royal Faculty. In this he was thorough and conscientious and many a candidate has had occasion to be grateful for his unexpected patience. He did not believe in writing unless he had something of real value to put on record. His few publications are marked by the clarity of expression and careful preparation which were so characteristic of the man. "Scouler" was an asset at any gathering whether medical or lay. He was a "good mixer" and had a host of friends. He was a keen sportsman, a good shot, and an enthusiastic angler, and he greatly enjoyed a day on the golf links. He was kindly and courteous, ever ready to help those in trouble, and he was held in the highest esteem by all his friends and colleagues. He was taking an increasing place in the councils of the profession in Scotland and his untimely death at the zenith of his career is a loss which we can ill afford. His wife, a daughter of the late Mr. John H. Hair, of Lossiemouth, who himself had medical interests, was his most devoted helper in all his many activities. To her, to his daughter and to his son, a recent Cambridge medical graduate, we offer our sincere sympathy.

Dr. HUGH HAMILTON BOYDEN died suddenly in Paris on June 30 at the age of 41. Dr. Boyden entered Bart's Hospital in 1922 and qualified by the Conjoint Diploma in 1928. After serving as casualty house-physician at Bart's he took up an appointment as house-surgeon at the Royal Portsmouth Hospital. Before the outbreak of war he volunteered for service with the R.A.M.C. and was gazetted lieutenant in September, 1939, but was later discharged on medical grounds. Dr. Boyden was an enthusiastic supporter of the B.M.A., which he joined in 1930, and was elected Assistant Secretary and Public Relations Officer of the Portsmouth Division. He was honorary anaesthetist at the Portsmouth and Southern Counties Eye and Ear Hospital, and from 1942 a member of the Portsmouth Insurance Committee, the Portsmouth Medical War Committee, and the National Service Board. His diverse activities brought him into contact with many medical men, who regarded him with affection and high esteem. We extend our sympathy to his widow, whom he married in 1946.

Medical Notes in Parliament

SUPERANNUATION REGULATIONS

Lord HENDERSON in the House of Lords on Aug. 5 moved that the Special Order on the Health Service (Superannuation) Regulations, 1947, be approved. His account of the regulations followed closely that given by Mr. John Edwards in the House of Commons on July 24 and reported fully in our issue of Aug. 9 (p. 232).

The Earl of MUNSTER said the regulations were highly complicated. The Opposition did not intend to divide the House on this resolution, but it would be well to recall that the medical profession was not committed in any way to the details embodied in the Order, nor would they be so committed until they had further knowledge of all the other details which were necessary in dealing with the Government's proposals under the principal Act, and, furthermore, until they ascertained the views of the profession. He pointed out that the Order made no provision for interchangeability in the case of a medical officer who transferred from local government service to university service. He believed some concession should be made to doctors for their long period of training and late age of entry into this scheme, which must prevent them from qualifying for the maximum pension at the normal retiring age. As for the older doctor, he would like to see some concession by way of added years for the practitioner who would enter the service on the Appointed Day. It was clear that the Government could not concede either of those points in the draft regulations because the House had to accept or reject the regulations as a whole, but perhaps Lord Henderson could give an assurance that no medical practitioner who was entitled to enter the Service would be denied the opportunity for superannuation because of his age.

Lord HENDERSON said it was true that the scheme made no provision for medical officers who transferred from local government service to university service. But the Ministry was in sympathy with the point, which would be borne in mind when an opportunity presented itself for legislation amending the Local Government Superannuation Act, 1937. As to a suggestion that the scheme should cover the staffs of medical schools, the terms of the Act were such that it could cover only those actually engaged in the health services. He could not hold out any hope of added years being granted in respect of the medical practitioner's training. If that was done for doctors the same concession would have to be accorded to every profession. All doctors would enter the scheme in their last year in hospital after qualification. In the normal case this would be at 23 or 24 years of age, when they could look forward to forty years' service and to earning their full pension on retirement.

Lord LLEWELLIN said that when additional technical men were recruited at the Admiralty there was some provision for giving added years.

Lord HENDERSON said he would look into the point, but his information was that there was at present no public scheme under which added years were granted. In respect of the elderly doctor, preferential treatment could not be given. To give it would have repercussions on other groups within the scheme. The elderly practitioner who had reckoned to provide for his retirement from the sale of his practice would not be worse off under the new arrangement, and, in addition, might earn something for the future under the new scheme. He might continue for an extra year or two after 65 to complete the qualifying period of ten years for pension. Lord Henderson gave an assurance that the Minister would deal with such a case in a sympathetic and understanding manner. He said that in any case the elderly practitioner would after five years be entitled to any of the lump sum benefits. In respect of the immediate cover and the immediate pension, provision for the qualifying period was contained in all existing public service schemes, and there seemed no good reason for departing from it in the present one. He could not hold out any hope of the scheme being modified at this stage to provide for immediate cover and minimum cover. The arguments of Lord Munster would be borne in mind by the Minister when the operation of the scheme was being reviewed. No scheme could be regarded as definitive for all time. Whatever modifications were found to be necessary would be made to ensure that the scheme worked to the best advantage of all employed in the National Health Service.

The House then agreed to the special Order.

Scottish Regional Areas

On July 29 Mr. SNADDON moved that the National Health Service (Scotland) (Determination of Areas of Regional Hospital Boards) Order, 1947, dated June 5, 1947, be annulled. He said objection was taken to certain of the areas as being unsatisfactory—for example, areas No. 3 Eastern Region and No. 5 Western Region so far as they related to the county of Perth. The Secretary of State had decided to include the whole of the county of Perth in the Eastern Hospital Region in direct opposition to advice he received from the British Medical Association and the British Hospitals Association. He had ignored the natural affiliation of West Perthshire with the county and market town of Stirling and also the advice given by his medical experts.

Col. GOMME-DUNCAN remarked that patients in West Perthshire would still be able to go to their previous hospital centre, but many difficulties might result if that hospital area was not prepared to receive them.

Sir JOHN GRAHAM KERR pointed out that in the scheme before the House the distribution of population and the number of hospitals were unequal between the approximately equal medical schools of Glasgow and Edinburgh. One was allocated a population of nearly 3 millions and the other a population of a little over 1 million. This plan, if carried into effect, would be a tremendous blow to the medical school of the University of Edinburgh.

Mr. MALCOLM MCMILLAN advocated the inclusion of the Outer Hebrides in the Western Region based on Glasgow rather than in the Northern Region.

Mr. NIALL MACPHERSON said one would naturally consider that the South-West of Scotland would look to Glasgow, but he had received representations from the B.M.A. Branch in the South-West that they desired that area to be linked with Edinburgh.

Mr. WESTWOOD, replying for the Government, said the convenience of patients was the first thing to be considered if effective results were to be obtained from the new legislation. Before any action was taken he had consulted the Scottish Universities, the three Scottish medical corporations, the British Medical Association, the Association of Mental Hospitals in Scotland, the Nuffield Provincial Hospital Trust, the local health authorities, the Scottish T.U.C., and the British Employers' Federation. Each organization was clearly advised that the boundaries of the Hospital Regions did not imply any restriction on the admission of a patient from one region to a hospital in another and would not restrict the undergraduate or postgraduate medical teaching of students from one university in a hospital associated with another university. It was intended that the Northern Region, which had no university within its boundaries, should be associated principally with Aberdeen University but also with Edinburgh and Glasgow Universities in view of local associations. Since the order was made he had received representations concerning the Outer Isles, Moray and Nairn, Western Perthshire, Dumfries, Stirling, and Clackmannan. There was no hospital in Western Perthshire, and there was not likely to be one for a year or two under the National Health Service. The argument that patients and medical practitioners in the Outer Isles had always looked to Glasgow for hospital and specialist services was recognized when the boundaries were fixed, but the Outer Isles were allocated to the Northern Region to avoid splitting the areas of the two local health authorities. Development of hospital and specialist services in the Northern Region, together with improved air communications with Inverness, would influence the flow of patients, but people in the Outer Isles would still be free to seek admission to the Glasgow hospitals. A provisional proposal to put Nairn in the North-East Hospital Region had been strongly opposed by the British Hospitals Association, so it was transferred to Inverness County. Ten times more patients went from Nairn to Inverness than went to Aberdeen.

The Regional Boards had not yet been set up, but as soon as the boards and chairmen were appointed there would be meetings at which the Scottish Office would attempt to give guidance on the co-ordination of the services. At present the central hospitals in Glasgow and Edinburgh took patients without regard to areas, and there was no intention of interfering with the past arrangement. In densely populated areas such as Glasgow, where there were several hospitals in a small area, the intention was to set up an admission bureau to deal with applications according to the urgency of the need for in-patient treatment. The general practitioner would know where the best service was to hand, and through him arrangements would be made for the patient's entrance into hospital.

On an assurance from Mr. Westwood that if the regional allocation was found to be imperfect he would adjust to make for efficient hospital administration, Mr. Snaddon withdrew his motion for the annulment of the Order.

Medical Members of Regional Boards

Mr. HUGH FRASER, on July 31, asked the Minister of Health why Staffordshire had no official medical representation on Regional Hospital Board No. 12, Birmingham; and why he had accepted only three of the six nominations put forward by the medical profession for this board.

Mr. BEVAN observed that it had never been intended that the members of boards should be delegate representatives of particular areas or particular interests. They were persons appointed as a team for their knowledge and experience, after consulting the various professional and other bodies. This board of 29 members included eight medical men, of whom two were suggested by the University, four by medical professional bodies, and one by a hospital body. He was satisfied that this provided a proper balance of medical knowledge and experience.

Infantile Paralysis.—Col. STODDART-SCOTT on Aug. 7 asked the Lord President of the Council what public money was spent on research into the causes, prevention, and treatment of infantile paralysis. Mr. Herbert Morrison said research on virus diseases, of which infantile paralysis was one, formed an important part of the programme of the Medical Research Council, and over £10,000 was being spent upon it in the present year. The proportion of this represented by the salaries of workers devoting most of their time at present to studying infantile paralysis was about £2,000.

Vitamin C.—As children over five can obtain an adequate amount of vitamin C from their ordinary diet, Mr. Strachey does not propose to extend the present age limit for the allocation of orange juice.

The Ministry of Pensions have now issued the *First Report of the Standing Advisory Committee on Artificial Limbs* (H.M.S.O., price 3d.). The Committee, under the chairmanship of Sir Charles Darwin, F.R.S., was charged by the Cohen Committee to investigate certain problems relating to the design, manufacture, and fitting of artificial limbs, and to study ideas and suggestions submitted by members of the public. The committee has examined 103 suggestions from various sources, of which 39 were considered worthy of research. It has paid particular attention to the production of a mechanical hand. Research has been carried out at the drawing office and workshop in the Limb Fitting Centre at Queen Mary's Hospital under the direction of Dr. Craft. Prosthetic devices in various other countries have been examined, and a visit was paid to Germany in 1946, particularly to estimate the value of the cineplastic and Krukenberg operations. The cineplastic operation was not considered to be suitable until a lighter prosthesis was available. Discussing the Krukenberg operation, the committee says that it is not fully prepared to recommend that it should be carried out in England; however, it should not be denied to amputees, particularly those blinded, who wish to undergo it.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The late Dr. Louis Cobbett, formerly Lecturer in Pathology in the University, left £1,000 to the Department of Pathology to be applied by the person for the time being holding the post of professor of pathology in promotion of research in such manner as he shall think best.

H. M. Woodman, M.B., B.Chir., has been approved (in absence) for the degree of M.D.

UNIVERSITY OF LONDON

Prof. J. Z. Young, M.A., F.R.S., will deliver two public lectures in the physiology theatre, University College, Gower Street, W.C., on Tuesdays, Oct. 7 and 14, at 5.15 p.m. His subject is "The Structure of Peripheral Nerve and of Nerve Endings."

A course of six public lectures on "The Physiological Mechanisms of Vision" will be given by Dr. M. H. Pirenne in the physiology theatre, University College, on Wednesdays, Oct. 8, 15, 22, and 29, and Nov. 5 and 12, at 5 p.m.

Dr. Bernard Katz will deliver a course of six public lectures on "Transmission of Excitation in Nerve and Muscle" in the physiology theatre, University College, on Tuesdays, Oct. 21 and 28 and Nov. 4, 11, 18, and 25, at 5.15 p.m.

Students and others interested in the above subjects are invited to attend the lectures. Admission is free, without ticket.

On the occasion of the celebration of Foundation Day on Nov. 20 the degree of LL.D. (*honoris causa*) will be conferred on Viscount Nuffield.

Percy Cyril Claude Garnham, M.D., has been appointed to the University Readership in Medical Parasitology tenable at the London School of Hygiene and Tropical Medicine.

Francis Thomas Garnet Prunty, M.D., M.R.C.P., has been appointed to the University Readership in Chemical Pathology tenable at St. Thomas's Hospital Medical School from Oct. 1.

Frederick Robert Selbie, M.D., Ph.D., has been appointed to the University Readership in Bacteriology tenable at Middlesex Hospital Medical School from Oct. 1.

The degree of D.Sc. has been conferred on Prof. E. J. King, Ph.D., Professor of Chemical Pathology at the British Postgraduate Medical School.

The University of Toronto has been added to the list of approved institutions for the purposes of the M.B., B.S. degrees for external students.

The Warneford Hospital, Oxford, has been provisionally recognized for the purposes of the Postgraduate Diploma in Psychological Medicine under category (1) Institutions for Mental Diseases, and Great Barr Park Colony, Birmingham, has been recognized for the purposes of the Postgraduate Diploma in Psychological Medicine under category (2) Institutions for Mental Deficiency.

Selly Oak Hospital, Birmingham, and Dudley Road Hospital, Birmingham, have been added to the list of recognized institutions for the External Diploma in Clinical Pathology.

UNIVERSITY OF MANCHESTER

Andrew Topping, M.D., F.R.C.P., has been appointed Professor of Preventive Medicine and Director of the Department of Preventive Medicine of the University and will take up his duties in November.

UNIVERSITY OF SHEFFIELD

The offices of the Dean of the Faculty of Medicine of the University are now at 358, Mushroom Lane, Sheffield, 10 (Tel.: Sheffield 63376).

UNIVERSITY OF ST. ANDREWS

George Howard Bell, M.D., F.R.F.P.S., lecturer in physiology in the University of Glasgow, has been appointed Professor of Physiology in University College, Dundee.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College, held on July 31, with the President, Lord Moran, in the chair, the following Fellows of the College were elected officers for the ensuing year: *Censors*, George Graham, E. Bellingham Smith, William Johnson, Sir Adolphe Abrahams; *Treasurer*, W. G. Barnard; *Registrar*, H. E. A. Boldero; *Assistant Registrar*, W. D. W. Brooks.

The Registrar announced that the Murchison Scholarship for 1947 had been awarded to Constance C. Forsyth, M.B. The Baly Medal was awarded to Prof. B. A. Houssay (Buenos Aires) for his services to physiology by his researches on endocrine control of carbohydrate metabolism, and the Bisset Hawkins Medal to Dr. C. H. Andrewes, F.R.S., for his researches in typhus and influenza.

Dr. F. M. R. Walshe was appointed Harveian Orator and Dr. J. A. Charles, Bradshaw Lecturer, both for 1948. The following lecturers for 1948 were also appointed: Lumleian, Dr. J. F. Nattrass; Goulstonian, Dr. C. M. Fletcher; Oliver-Sharpey, Dr. J. F. Wilkinson; Mitchell, Dr. R. Coope; Abrahams, Dr. J. W. Trevan.

Lord Moran was elected representative of the College on the National Consultative Committee for the United Kingdom on Food and Agriculture Organization of the United Nations.

The following, having satisfied the Censors' Board, were elected Members of the College:

E. W. Abrahams, M.D., A. G. V. Aldridge, M.D., V. H. Allan, M.B., D. J. Arkle, B.M., K. Aterman, M.D., H. W. Balme, M.B., G. M. K. Baloch, M.D., J. A. Bassett, L.R.C.P., O. D. Beresford, M.B., A. Bloom, M.D., W. J. H. Butterfield, B.M., J. R. Chatterjee, M.B., H. Conway, M.B., J. A. Cosh, M.B., R. A. Craig, M.B., E. G. A. Crawshaw, M.B., D. M. Douglas, M.B., A. Y. Ekdawi, M.B., J. R. Ellis, M.B., E. Emanuel, B.M., M. Feiwel, M.B., H. M. Foreman, M.B., J. H. Goonewardene, M.B., N. S. Gordon, M.D., L. Guttmann, M.D., J. B. Hannah, M.D., W. J. Hay, M.B., K. W. G. G. Heathfield, M.D., C. Langton Hewer, M.B., A. J. Hird, M.B., J. A. Hobson, M.D., W. H. Hood, M.D., Margaret E. Hughes, M.B., D. B. Irwin, M.B., D. L. Jenkins, M.B., R. A. Jones, M.B., F. E. Joules, M.D., R. E. Kelly, M.B., J. D. Kidd, M.B., G. L. Leathart, M.B., J. M. Ledingham, L.R.C.P., K. N. Lloyd, M.B., J. S. Logan, M.D., T. P. Loke, M.B., P. M. McAllen, M.B., J. K. G. MacArthur, M.B., S. L. Malhotra M.B., D. E. Marmion, M.B., J. A. Milne, M.B., R. Montgomery, M.B., Captain, R.A.M.C., G. A. Neligan, B.M., J. H. Paterson, M.D., A. Poteliakhoff, M.B., J. D. L. Reinhold, B.M., Margaret L. Reinhold, M.B., A. H. T. Robb-Smith, M.D., R. W. Rowan, M.B., J. E. Royds, M.B., W. F. Scott, M.B., G. B. Shaw, M.B., B. H. Smith, M.B., T. Stapleton, B.M., R. S. Stevens, M.B., C. Symons, M.B., Margaret L. Taylor, M.B., H. E. Thomas, M.B., P. H. Tooley, M.D., S. C. Truelove, M.D., H. R. E. Wallis, M.B., F. J. H. Walters, M.B., M. Watt, M.B., H. F. West, M.B., C. B. I. Willey, B.M., M. W. W. Wood, M.B.

Licences to practise were conferred upon 137 candidates (including 28 women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the necessary by-laws:

K. R. V. Argles, D. A. L. Ashforth, R. W. Attwood, J. M. Barritt, Janet B. Bell, J. H. Blackman, E. I. Boxer, D. G. Boyle, G. P. Bradfield, J. P. P. Bradshaw, H. R. Bridgford, T. C. L. Brown, C. M. Browse, K.-L. Bucky, Pauline P. Budd, G. H. Bulow, M. Caturani, K. L. Cleminson, J. M. Clubb, R. O. N. G. Colley, K. J. Covell, K. A. Cowan, W. R. Daniel, A. I. Darling, C. J. C. Davey, A. C. Davies, L. Dawson, Jacqueline Domenet, Ada Dudack, M. L. Dyson, Pamela M. Farmer, Loveday A. Farquharson, V. Feldman, T. J. Felix, W. J. Gall, J. H. Garson, N. Garwood, J. M. Gate, C. E. R. Gee, E. Gellatly, J. V. Gibson, Joy K. Goodacre, J. D. Greatrex, J. K. G. Grieves, R. H. Griffith, M. Grinstein, Angela W. Hall-Smith, B. Hardie, G. Harris, S. J. Harris, C. Havard, T. G. Heron, Stella C. Hill, D. Hobson, J. A. G. Holt, A. P. K. Homayouni, V. E. Ireland, Helen A. Jaques, Barbara Jones, D. G. Jones, A. H. Kasasian, M. R. R. Khan, D. B. Leaming, J. Lederer, W. Lees, Ruth M. Licence, Joyce J. P. Lomas, T. McCaffry, R. I. MacInnes, I. D. Mackichan, J. A. Mahoney, A. E. B. Matthews, M. D. Mehta, F. W. Millard, I. O. Miller, A. L. Mintz, Barbara A. Moore, C. T. Morgan, Dorothy A. Morgan, A. H. Morris, M. Morris, H. J. Moss, G. N. Mulliner, D. J. Oakland, H. Owen, Susan H. Palmer, R. T. Parr, R. F. Pearson, A. R. Penn, R. S. Pine, R. C. S. Pointon, P. Pratt, J. Prestt, Violet M. J. Procter, P. K. Pybus, D. M. Rahilly, D. M. Reader, Pauline Readman, E. R. Reid, Sybil L. Reis, Joan Rendall, D. Rider, S. M. Rivlin, J. C. Rushton, A. J. Ruzicka, P. W. Seargeant, P. G. Sesar, J. Southgate, Sheila J. Spencer, H. Spira, A. H. Stern, J. D. Stevens, D. B. Stott, Rosa Sutton, P. B. Taylor, J. R. Theobalds, J. M. Thomas, J. M. Titmas, Olive I. Todd, Ruth W. Towler, P. G. Treharne, J. S. Turner, M. H. Turner, C. R. B. Vincent, I. McN. Walter, N. Don J. de S. Wijesekera, W. M. Wilkinson, K. P. Williams, L. B. Williams, Sheila G. Wills, G. Wiseman, C. H. Wood, Yvette Woodford-Williams, G. R. V. Worrall, Pamela N. Wright, F. Wynn, R. E. V. B. Young.

Diplomas in Public Health were conferred, jointly with the Royal College of Surgeons of England, on the following successful candidates:

A. S. Darling, D. C. Davidson, H. McI. Davies, W. J. Elwood, B. L. Frank, R. M. Galvan, G. I. Harding, J. H. Hudson, R. W. Kind, Evelyn M. Lee, N. C. Lendon, J. A. Lister, D. MacLeod, R. J. Niven, R. N. Onyemelukwe, J. H. Rayner, C. A. Royde, B. Schwartz, R. W. Scott, M. Shamsuddin, C. H. Shaw, R. Shoulman, K. N. Srivastava, W. F. Tierney, K. O. A. Vickery, J. R. D. Williams, H. D. Wilson.

The following Diplomas were also conferred, jointly with the Royal College of Surgeons of England. The names of the successful candidates were printed in the issues of the *Journal* indicated in parentheses:

Diplomas in Anaesthetics (July 5, p. 37, and July 26, p. 156); Diploma in Laryngology and Otology (July 26, p. 156); Diploma in Child Health (July 5, p. 37); Diploma in Medical Radiotherapy (May 31, p. 789); Diploma in Psychological Medicine (July 26, p. 156); Diploma in Industrial Health (July 26, p. 156); and Diploma in Medical Radio-diagnosis (May 31, p. 789, and July 5, p. 37).

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College, held on July 31, with Sir Alfred Webb-Johnson, Bt., President, in the chair, it was decided that candidates for the final F.R.C.S. must have served a period of postgraduate surgical training of 12 months in posts approved by the College and that six months of this period must have been occupied in residence in a hospital recognized for the purpose.

Diplomas of Membership were granted to the 137 successful candidates whose names are printed above in the report of the meeting of the Royal College of Physicians of London; Diplomas in Public Health were granted, jointly with the Royal College of Physicians of London, to the 27 successful candidates named in the same report.

No. 30

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947					1946 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	31	—	23	3	—	41	6	17	1	3
Deaths		—	1				1	1		
Diphtheria	174	15	33	13	2	308	22	74	32	10
Deaths	2	—	—		—	2	—	—	—	—
Dysentery	61	11	23	—	—	90	27	29	—	—
Deaths					—				—	—
Encephalitis lethargica, acute	3	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			22	7	3			33	9	1
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				51					61	
Deaths	61	4	20		5	38	1	12	3	4
Measles*	7,644	373	60	332	10	3,741	478	161	58	2
Deaths	4	—	—		—	4	—	—	—	—
Ophthalmia neonatorum	55	1	17	—	—	72	6	16	1	—
Deaths										
Paratyphoid fever	18	2	—	—	—	14	1	1(A) 1(B)	—	—
Deaths	—	—	1		—	—	—	—	—	—
Pneumonia, influenzal	311	18	1	1	5	363	18	2	2	3
Deaths (from influenza)†	7	—	—		—	1	—	—	—	—
Pneumonia, primary		17	142	15	7		16	125	22 5	6
Deaths										
Polio-encephalitis, acute	34	8				—	—			
Deaths		2					—			
Poliomyelitis, acute	302	51	28	6	7	18	—	2	2	—
Deaths		2					—			
Puerperal fever		1	8		—		3	16		—
Deaths										
Puerperal pyrexia‡	133	6	8	1	—	145	16	16	3	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	987	76	96	25	19	994	86	92	14	16
Deaths	—	—	—		—	—	—	—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	8	1	—	3	3	8	—	10	5	—
Deaths	—	—	—		1	—	—	2	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	1,924	233	31	71	4	2,468	166	29	44	14
Deaths	5	2	2		—	8	1	3	—	—
Deaths (0–1 year)	337	41	59		12	342	53	59	20	11
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,828	596	569		100	3,851	632	499	168	108
Annual death rate (per 1,000 persons living)			11·8					11·0	10·8	
Live births	9,124	1479	1166		268	8,778	1378	1104	356	236
Annual rate per 1,000 persons living			23·5					22·2	22·8	
Stillbirths	248	31	35			285	37	26		
Rate per 1,000 total births (including stillborn)			29					23		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

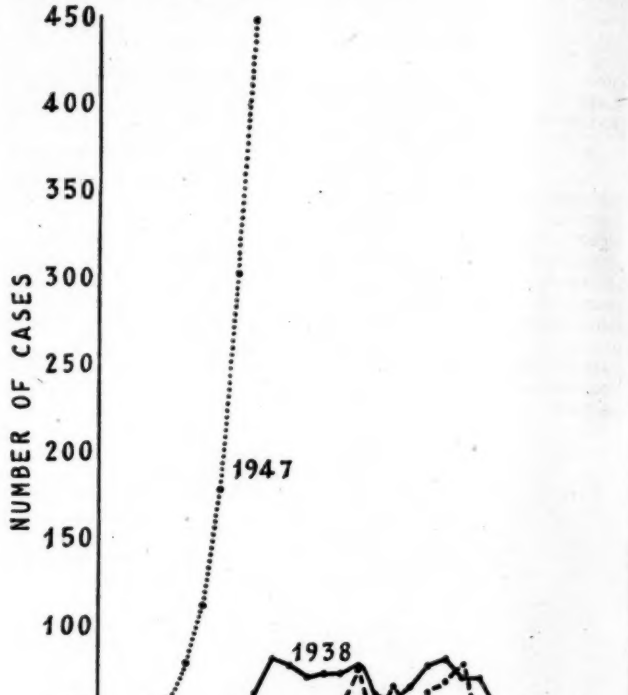
‡ Includes puerperal fever for England and Wales and Eire.

The return of births and deaths for Eire is not available this week.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

The notifications of poliomyelitis in England and Wales for the week ending Aug. 2 numbered 448, compared with 302 and 177 in the two preceding weeks. The graph shows the rise and fall of the outbreaks in 1926 (1,160 cases) and 1938 (1,462 cases) in contrast to the steeply rising curve of notifications this year. The seasonal rise began about six weeks earlier than usual, and the previous record figure of 81 cases in the 32nd and 42nd weeks of 1938 was passed in the 28th week of 1947, when there were 110 notifications.



The 448 cases notified during the week ended Aug. 2 represent an increase of about 50% on the figure for the previous week (302). A rate of increase of this order has now been recorded for the last four weeks, and provisional figures for the week ending Aug. 9 suggest that it is still continuing.

The largest increases in notifications were in the following county areas, which include county boroughs (the figures for the previous week are shown in parentheses): Durham 45 (20), Lancs 36 (17), Yorks E.R. 16 (3), Yorks W.R. 70 (52), and Surrey 32 (15).

Corrected notifications of acute poliomyelitis in England and Wales for the March quarter of this year have just been published. There were 6 "non-civilian" cases. There were 96 civilian cases, in 2 of which the age was not known. Of the remaining 94 cases 5 were under 1 year, 13 were aged 1–3, 7 were aged 3–5, 13 were aged 5–10, 13 were aged 10–15, 25 were in the age group 15–25, and 18 were over 25 years of age. In the same quarter there were 4 cases of acute polio-encephalitis notified.

In the period from March 30 to July 26 of this year in England and Wales there were 911 original notifications of acute poliomyelitis, and 106 cases of polio-encephalitis. The counties or county boroughs most affected were: poliomyelitis—Yorkshire West Riding (153), London (113), Lancashire (85); polio-encephalitis—London (21), Surrey (15), Yorkshire West Riding (10).

Pathological Specimens

As a result of a recent memorandum on acute poliomyelitis prepared by Medical Officers to the Ministry of Health (July 26, p. 141) a large number of specimens have reached the Virus Reference Laboratory, Colindale Avenue, London, N.W.9. The

laboratory is grateful for the co-operation of clinicians and pathologists. It is, however, necessary to emphasize that the virus of poliomyelitis has never been isolated from spinal fluid, and specimens of cerebrospinal fluid were requested only from cases where it was possible that some other neurotropic virus might be the cause of the illness. Such specimens must be transported packed in ice; specimens sent by ordinary post are of no value. Specimens of faeces are not requested at present, as monkeys, which are the only animals suitable for primary isolation of the virus, are not available for this purpose for the time being.

In addition to the post-mortem specimens in glycerol saline asked for by the Virus Reference Laboratory, Colindale, it is also requested that representative specimens of spinal cord, as much as possible of the brain stem, and pieces of cortex including the motor area be preserved in formol saline and sent either to Prof. J. McIntosh, Middlesex Hospital, Mortimer Street, London, W.1, or to Dr. J. G. Greenfield, National Hospital for Nervous Diseases, Queen Square, London, W.C.1.

Paratyphoid B Outbreak

Investigation of the recent outbreak of paratyphoid B at Lea Valley Cottages, Wheathampstead, continues. Since our earlier report (Aug. 9, p. 235) routine testing of blood and faeces of the persons living in the row of twelve cottages, from which all the early cases arose, has given positive results in 3 further cases. One is the mother of the original case; another is the father in a household from which several cases have already been isolated; the third is also the father in an infected household with five or six patients. This last man appears to be an intermittent urinary carrier and was a Regular Army soldier for some 13 years up to 1945, most of his service being in India.

Diphtheria Immunization in Scotland

Since 1941 about one million Scots children have been immunized against diphtheria under local authorities' schemes. It is also estimated that out of 1,237,000 Scots children under fifteen 765,000 have been immunized. This information is given by the Department of Health for Scotland in a brochure setting out details of the publicity material available to authorities for local campaigns in 1947. The objective, the brochure emphasizes, is to secure the immunization of the whole child population of Scotland. At present the leeway to be made up is chiefly among pre-school children. A special effort should be directed towards immunizing young children at the earliest suitable age, that is, at or shortly before the child's first birthday.

Discussion of Table

In *England and Wales* there were 756 fewer notifications of measles than during the previous week. Decreases were also recorded for scarlet fever 49, cerebrospinal fever 29, diphtheria 28, and whooping-cough 7, while increases occurred in the notifications of acute poliomyelitis 125 and acute polioencephalitis 18.

The south-eastern and eastern counties were mainly responsible for the decline in measles notifications, contributing a fall of 433 cases. Other large decreases in the incidence of this disease were reported from Yorkshire West Riding 263 and the North-Midland counties 130. On the other hand 308 notifications were made from Northamptonshire, an increase of 111 on the previous week.

The decrease in the incidence of scarlet fever was spread fairly evenly over the whole country, and there were only small local variations in the notifications of whooping-cough compared with the week ending July 19.

The largest decreases in the notifications of diphtheria were Lancashire 12 and Yorkshire West Riding 10. Of the 18 notifications of paratyphoid, 10 were reported from Hertfordshire (St. Albans U.D.) and are referred to above.

The increase of 135 notifications of acute poliomyelitis was the largest weekly increase yet recorded. These 302 cases were reported from 37 counties in England and Wales, the largest increases on the previous week being London 32, Yorkshire West Riding 26, Middlesex 11, Warwickshire 11, Durham 7, Essex 7, and Kent 6. Northamptonshire, Westmorland, and Monmouthshire with 1, 2, and 1 cases respectively, in the week ending July 19, reported no fresh cases in the following week, whereas six counties which had no cases in the earlier week reported as follows for the week under discussion: Nottinghamshire 1, Oxfordshire 1, Isle of Wight 2, Brecknockshire 2, Cardiganshire 1, and Carmarthenshire 4.

In *Scotland* increases were noted in the notifications of primary pneumonia 40, dysentery 11, measles 10, and acute poliomyelitis 9. Of the 28 cases of acute poliomyelitis reported, Glasgow accounted for 13.

In *Eire* scarlet fever notifications were 6 fewer than in the previous week, but measles notifications rose by 110 and whooping-cough notifications by 18.

In *Northern Ireland* a decline from 29 to 19 notifications of scarlet fever was the only notable difference from the previous week.

Quarterly Returns for Eire

The birth rate during the March quarter of 1947 was 23.3 per 1,000, which is 0.8 greater than that of the corresponding quarter of 1946. An infant mortality rate of 92 per 1,000 registered live births was reported, compared with 81 per 1,000 in the 1946 March quarter. The maternal mortality rate was 1.4 per 1,000 registered births. The death rate from all causes was 21.4 per 1,000 of the population, compared with 17.4 in the March quarter of 1946. The death rate from all forms of tuberculosis was 1.3 per 1,000, of which pulmonary tuberculosis was responsible for 1.0; the tuberculosis rates for the corresponding quarter of the previous year were very similar (1.2 for all forms and 0.9 for pulmonary tuberculosis). Deaths from the principal epidemic diseases represented a rate of 0.5 per 1,000, as in the first quarter of 1946; the number of deaths recorded from these diseases were typhoid fever 8, scarlet fever 1, whooping-cough 106, diphtheria 19, measles 10, and diarrhoea and enteritis under 2 years 232.

Week Ending August 2

The notifications of infectious diseases in England and Wales during the week included: acute poliomyelitis 448, acute polioencephalitis 39, scarlet fever 803, whooping-cough 1,737, diphtheria 200, measles 6,954, acute pneumonia 271, cerebrospinal fever 48, dysentery 53, paratyphoid 19, and typhoid 6.

Medical News

Milk for Children

From Aug. 1 children attending grant-aided nursery schools are to receive 2/3 pint of milk a day. As from the same date a pint of milk daily at 1½d. per pint will be available from the registered suppliers all the year round for children between the ages of 5 and 16 who are unable, because of mental or bodily disability, to attend school, and, in the case of mental disability, have not been notified or reported to the Mental Deficiency Act authority, or, having been so dealt with, are not in an institution or attending a full-time occupation centre to which the milk-in-schools scheme applies. Parents or guardians should apply to the local food office for Form WF. 42.

Speech Therapists

There are between 75,000 and 100,000 children needing treatment for speech defects. The Minister of Education, speaking on June 28 at the opening of the Moor House School, Hurst Green, Surrey, which is the first school in this country to cater specially for children whose defects require treatment by speech therapists, said that local education authorities were at their wits' end to secure more therapists. About 500 are needed, which is 350 more than are now employed. There are 107 students now in training as speech therapists.

Award to Lord Stamp

The American Government has awarded the Medal of Freedom with Silver Palms to Lord Stamp for his services during the war, when he was British scientific liaison officer for biological research in the U.S.A. from November, 1943, to December, 1945.

Deputy Secretary to Ministry of Health

The Minister of Health has appointed Mr. J. M. K. Hawton, C.B., to be a Deputy Secretary to the Ministry of Health following the appointment of Sir Arthur N. Rucker to urgent duties with the preparatory commission to the International Refugee Organization.

Register of Dietitians

The Board of Registration of Medical Auxiliaries has published a third edition of the *Register of Dietitians*, and medical practitioners can obtain copies free on application to the registrar of the Board at Tavistock House North, Tavistock Square, London, W.C.1.

Education Ministry and Health

The Medical Branch of the Ministry of Education, which deals with the School Meals Service, the School Health Service, and Special Educational Treatment for Handicapped Pupils, is from Aug. 1, 1947, to be known as the Special Services Branch.

Wills

Dr. Anthony Richard Neligan, of Droitwich, who died on Dec. 8, 1946, left £31,907.

COMING EVENTS

Aslib Conference

The 22nd annual conference of the Association of Special Libraries and Information Bureaux will be held on Sept. 19–21 at the London School of Economics, Houghton Street, W.C.2, and Canterbury Hall, Cartwright Gardens, W.C.1. Prof. R. E. Peierls, F.R.S., will deliver the opening address on Sept. 20 at 11 a.m. on "The Effect of Atomic Energy Developments on Scientific and Technical Publication."

Old Students' Dinner

St. Thomas's Hospital Old Students' Dinner will take place at Church House Restaurant, Great Smith Street, Westminster, S.W., on Friday, Oct. 3, at 6.45 p.m. for 7.30 p.m., when the chair will be taken by Mr. C. A. R. Nitch, M.S., F.R.C.S. Rationing restrictions will limit the number of places to 250. If therefore the number of applications exceeds 250, the list will be closed and unsuccessful applicants notified. It is regretted that no guests may be invited this year. Speeches will be strictly limited. The price of the dinner, inclusive of gratuities and drinks during dinner, will be 25s. Dinner jackets or lounge suits will be worn.

Ophthalmological Congress

The executive committee of the Third Pan-American Congress of Ophthalmology has issued a general invitation to all members of the British Medical Association interested in ophthalmology to attend the congress, which is to be held at Havana, Cuba, from Jan. 4 to 10, 1948. The president of the Congress is Dr. Tomas R. Yanes, P.O. Box 970, Havana, Cuba.

Advancement of Science

The American Association for the Advancement of Science will meet at Chicago on Dec. 26–30. Further information may be obtained from the society's headquarters, Smithsonian Institution, Washington, D.C.

APPOINTMENTS

The Civil Service Commissioners have appointed Drs. D. A. Ogden and F. Y. McKendrick to be medical officers in the Prison Service of England and Wales.

BOARDMAN, D. L., M.B., Ch.B., Assistant Pathologist, Bolton Royal Infirmary.

BODKIN, KATHLEEN M., M.R.C.S., L.R.C.P., Senior Assistant Medical Officer of Health, Borough of Hendon.

JACKSON, S. H., M.B., Ch.B., Pathologist, Bury Infirmary.

LONDON COUNTY COUNCIL.—The following appointment in the Council's mental health services at the hospital indicated in parentheses is announced: *Assistant Medical Officer*, G. C. Heller, M.D. (Friern).

MILLEN, R. M., M.D., M.R.C.O.G., Obstetrician, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

BIRTHS, MARRIAGES, AND DEATHS

The charge for an insertion under this head is 10s. 6d. for 18 words or less. Extra words 3s. 6d. for each six or less. Payment should be forwarded with the notice, authenticated by the name and permanent address of the sender, and should reach the Advertisement Manager not later than first post Monday morning.

BIRTHS

DAVIES.—On Aug. 6, 1947, to Dr. Celia Marjorie Davies (*née* Rapport), wife of Dr. D. L. Davies, 13, Engel Park, N.W.7, a son.

DOYLE.—On Aug. 1, 1947, at Northampton, to Margaret (*née* Bethell), wife of Dr. G. B. Doyle, a son.

HAMILTON.—On July 30, 1947, at the London Hospital, to Norah, wife of Dr. Henry C. Hamilton, of Portrush, Co. Antrim, a daughter.

HARRISON.—On Aug. 7, 1947, at King's Lynn, to Mary (*née* Bowen), wife of John O. Harrison, F.R.C.S., a daughter.

REEVE.—On July 21, 1947, at Bristol, to Marjorie (*née* Organ), M.B., Ch.B., wife of C. P. Reeve, a daughter.

STANFORD.—On Aug. 3, 1947, to Elspeth Stanford, M.B., Ch.B. (*née* Harrison), wife of J. G. Stanford, a son.

TAIT.—On July 27, 1947, at Burton House Maternity Home, Stafford, to Maureen, wife of Squad.-Ldr. C. E. Tait, R.A.F.V.R., the gift of a daughter—Mary Edwina.

MARRIAGES

FLEMING—FIELD.—On Aug. 5, 1947, at Banbury, Oxon, Dr. H. F. Fleming to Dr. Sheila Field.

PEEL—MELLISH.—On July 26, 1947, John H. Peel, F.R.C.S., F.R.C.O.G., to Freda Margaret Mellish.

TILL—TUNSTALL-BEHRENS.—On July 23, 1947, in Cornwall, Kenneth Till, M.B., B.Chir., to Morwenna M. Tunstall-Behrens, M.B., B.Chir.

DEATHS

AMBROSE.—On July 30, 1947, at his home, 2, Hilton Drive, Paignton, Devon, after a long illness, Alfred Parker Ambrose, M.R.C.S., L.R.C.P., L.S.A., London. Aged 73 years. R.I.P.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Spread of Poliomyelitis

Q.—*Under the heading "Poliomyelitis and Water" (July 19, p. 119) you suggest that infection often comes from the virus carried in the nasopharynx and conveyed in food. Can fruit-pickers infect the fruit at their work? Can infected mucus washed out of the nasopharynx during bathing in fresh water or at bathing pools infect other bathers? Can flies or insects carry infected mucus or excreta to food or fruit? Will food or fruit be sufficiently cleansed by tap water?*

A.—It is possible for fruit to become infected with the virus of poliomyelitis, either directly from sprayed droplets and contaminated hands, or indirectly by faecal-feeding flies or dust. Various workers have drawn attention to the fact that poliomyelitis occurs during the fruit season and small localized outbreaks attributed to the eating of strawberries have been described (see Barber, G. O., *B.M.J.*, 1938, **2**, 1137). It is therefore advisable to wash all fruit and when possible to peel off the skin before giving it to children. Bathing pools may also become contaminated, and children should not be allowed to use bathing pools in areas where the infection is occurring.

Sulphur in Rheumatism

Q.—*The 1931 B.M.A. Committee on Chronic Rheumatism considered sulphur to be one of the few drugs of value in chronic osteoarthritis. Intramuscular or intravenous injections of colloidal sulphur are strongly advised for osteoarthritis in a modern textbook. Is there any knowledge of how this drug causes improvement?*

A.—There is considerable diversity of opinion as to the value of sulphur in rheumatism, but it has been used a great deal in America and good results have been claimed, especially when it has been combined with a low-carbohydrate diet—a point of some importance. Race, in an investigation into its biochemical action, found deficient sulphur oxidation in rheumatism, and Cawadias found deficient sulphur conjugation. The organic matrix of the joint cartilages contains chondroitic acid, which when broken down yields chondroitin and sulphuric acid, and it has been suggested that loss of sulphur from the cartilage may tend to the development of arthritis. Many workers have found a deficiency of cystine in the nails in sufferers from rheumatic diseases. Rawls *et al.*, treating cases with injections of colloidal sulphur, thought it was of most value in cases of rheumatoid and mixed arthritis. When injected it usually causes a pyrexial reaction, and its beneficial action has been attributed to this effect in line with such other methods as injections of milk, T.A.B., etc. When given by mouth it has a mild purgative action, and many regard this as the explanation of any benefit that may follow.

Fluorine and Dental Caries

Q.—*(a) Are minute quantities of fluorine in water essential for the proper formation of teeth? (b) What practical measures can be adopted to ensure that an infant obtains an adequate and assimilable intake of fluorine in a district devoid of natural fluorine? The incidence of dental caries is high in this area, mostly among young people, all teeth being extracted. The water supply is unprotected and thus potentially contaminated, so most people rely on rain-water collected in tanks. (c) What is the fluorine compound of choice for adding to water, and what quantity should be added to each 100 gallons (454.6 litres)?*

A.—(*a*) It has been demonstrated that children living continuously for the first twelve years of life in fluoride areas have a lower caries attack rate than those residing in fluoride-free areas. It has not yet been established, however, that the addition of fluoride to fluoride-free domestic water supplies will produce similar or identical results. Large-scale experiments

are now being carried out in various parts of the world to determine whether the addition of fluoride proves beneficial. It should be remembered that excess fluorides cause mottling and unsightly staining of the enamel. (*b*) It is possible to add fluoride to the drinking-water, though, as stated above, the evidence that this practice is beneficial is suggestive but not yet conclusive. (*c*) The compound normally used is sodium fluoride, added in the proportion of one part per million.

Sex Hormones and Prostatic Hypertrophy

Q.—*It is said that late in life the oestrogenic testicular hormone predominates over the male testicular hormone, and is thus responsible for prostatic overgrowth. Why, therefore, should oestrogenic substances be used for the treatment of carcinoma of the prostate? The results are often gratifying, but what is the rationale of this treatment?*

A.—There is a difference between non-malignant prostatic enlargement and carcinoma of the prostate. The theory put forward in the former case is based upon (1) actual assays of urinary oestrogens and androgens throughout life—the preponderance of oestrogens in older people is relative because of the diminution of androgens; and (2) experimentally oestrogens will produce a fibromuscular enlargement of the prostate, which is prevented in some degree by the simultaneous administration of androgens. Testosterone has been advocated for benign enlargement of the prostate, and, although it appears to produce symptomatic improvement, a committee of the Medical Research Council, investigating this, failed to establish any objective criteria of beneficial result. With regard to carcinoma of the prostate, oestrogens are given to inhibit the pituitary secretion of gonadotrophic hormone, with resulting disorganization and atrophy of the testes; that is, a physiological castration is produced, and as a result testicular androgens cease to be secreted. A similar effect is obtained by surgical castration, which is also used in this condition. The removal of testosterone constitutes the removal of an androgenic stimulus to the malignant prostate and its metastases. The results are good for a time—months or years—but ultimately relapse occurs.

Recurrent Otitis Media

Q.—*My two children have had many attacks of otitis media over the past year. During the last attack, a month ago, the girl, aged 5, had both drums punctured with immediate relief, and the boy, aged 4, recovered on sulphamezathine. Now both children are ill again, but the pain and tenderness have receded on sulphamezathine, although the drums are still red after a week of treatment. Both children snuffle, suggesting sinus trouble, but during the last attack, although the same symptoms were present, the specialist said none was evident. Is there any treatment to nose or throat likely to be effective? The girl still has her tonsils and adenoids, but the boy's were removed a year ago; his first attack of otitis media coincided with measles.*

A.—In all cases of recurrent otitis media the cause is in the nasopharynx. Sinusitis can be excluded with certainty by a good radiograph, and this would seem advisable in both children. In the girl's case tonsils and adenoids should be removed, and in both children any sinusitis treated. In the boy's case there are probably some small residual adenoids around the Eustachian opening which cannot be removed by a curette. They can be destroyed by irradiation with radium or deep *x* rays.

Menorrhagia in Middle Age

Q.—*What is the treatment for (non-neoplastic) menorrhagia of middle age? What, in this case, are the indications, dosage, and timing in the menstrual cycle for (a) ethisterone, (b) methyl testosterone? What dosage of the latter can be regarded as safe for avoiding the development of male characteristics?*

A.—Even when a neoplasm has been excluded there remain many possible causes for menorrhagia, and treatment varies accordingly. Useful advice on this case is not possible without further information. Ethisterone is indicated if the underlying trouble is shown to be a deficiency of progesterone during the second half of the cycle. It is much less active than progesterone itself, but a suitable dose for trial would be 5 to 10 mg. (in tablet form for sublingual absorption) thrice daily for seven to ten days premenstrually. Methyl testosterone is sometimes used for functional uterine haemorrhage, whether it be ovular or anovular; 5 mg. can be given by sublingual absorption once or twice daily during the whole cycle, but this treatment should not be continued for longer than two months without an interval.

There is some difference of opinion as to the dose of androgens which is "safe" as regards the production of virilism. It depends not only on the type of preparation used and the route of administration but also on the duration of treatment. Thus a large dose given for a few days only may have no ill effects, whereas a smaller dose continued for a long period may cause voice changes, hirsuties, etc. Above all, it should be recognized that women vary considerably in their susceptibility to testosterone; the age of the patient may also be a factor. It is therefore difficult to lay down hard-and-fast rules, but generally it is wise not to give more than 400 mg. of methyl testosterone (sublingual route) or more than 150 mg. of testosterone propionate (by injection) in any one month. In either case treatment should not be continued for longer than two months at a time, and careful watch should be kept for the first sign of a virilizing effect.

Obesity

Q.—*Is there a new American drug which "rapidly and safely reduces the weight of the obese, and which is devoid of any glandular material"?*

A.—The likelihood is that the new American drug is either dinitrophenol or amphetamine. The former may cause cataract and should never be used. The latter is not to be recommended, for two reasons. The first is that if patients take drugs for obesity they think they can eat as much as they like because the drug will make them thin; the second is that the taking of amphetamine over a period makes the patient nervous, excitable, unable to sleep, and liable to fainting attacks or collapse. There is only one treatment for obesity, which is severe restriction of the diet, maintained for at least three weeks. (See L. H. Newburgh, *Arch. intern. Med.*, 1942, **70**, 1033.)

Sterility

Q.—*A young man was examined for sterility after three years of marriage. The external genitalia were normal, but a specimen of semen contained only a third of the normal number of spermatozoa, fully motile and with no abnormal forms. No pus cells or organisms were found. Would treatment with sex hormones be of benefit, and what are the preparation of choice and the dosage? His wife appears to be normal.*

A.—A reduction in the total number of spermatozoa, without other evidence of spermatogenic inadequacy, is not sufficient indication that the male is responsible for the sterility; also, the total sperm count varies from time to time, and is especially depressed after frequent coitus or nocturnal emissions. Sterility is not unknown when both parties appear to be normal, and ultimate conception can take place even after ten years. If, however, repeated counts show a low total number of spermatozoa, gonadotrophic hormone of pregnant mare's serum, 1,000 units injected intramuscularly three times weekly, might be of help.

Sweating Hands

Q.—*During examinations a female student of massage, aged 21, suffers from profuse sweating of the palms of her hands to such an extent that massaging becomes difficult. Powdering her hands does not help. As she is likely to take only two more examinations and the condition does not occur in her normal work any operative procedure such as sympathectomy would seem too radical. What drug would be most helpful and in what dose should it be prescribed? It must not, of course, give rise to unpleasant side-effects during the examination. It is feared that tincture of belladonna might cause unpleasant drying of the mouth.*

A.—Belladonna is almost certainly the answer to this problem. Of the tincture she will probably need 20 minims (1.2 ml.) taken three-quarters of an hour before the examination. The dryness of the mouth will not be enough to cause distress or difficulty in answering the examiner. The effect of belladonna on this student should be studied carefully as soon as possible.

The dose to produce decided dryness of the mouth should correct the hand-sweating. Preliminary tests with 10 minims (0.6 ml.) will also reveal any undue susceptibility to the drug.

Toxic Dosage of Vitamins A and D

Q.—*Recently a poultry journal stressed the risk of giving too much cod-liver oil to chicks; overdosage is said to give rise to "crazy chick disease"—which causes the chick to lose its sense of balance; it tends to sway backwards on to its haunches and gives the impression that it is suffering from leg weakness. Is there any evidence of comparable effects in the human?*

A.—No condition comparable to the disease in chicks has been reported in man from consuming large quantities of cod-liver oil. It is virtually impossible to produce hypervitaminosis A or D in humans by ingesting large quantities of cod-liver oil. Nausea and vomiting would occur long before a toxic level is reached. The toxic dose of vitamin A, if taken for a prolonged period, is in the region of 240,000 units daily, and that of vitamin D is probably 200,000 units or more. This amount of vitamin A is present in 8½ oz. (240 ml.) of cod-liver oil, and the vitamin D in nearly 90 oz. (2.65 litres). It would be impossible to consume this amount daily for any length of time.

Retrosternal Pain

Q.—*I suffer from pain behind the sternum opposite the fourth costal cartilage; this started four years ago and is of a colicky nature, occurring once or twice weekly, day or night, three to four hours after meals, and is relieved by swallowing or by a hot drink. Left alone it may remain from five to twenty minutes. There are no other complaints. What are the nature and treatment of this condition?*

A.—This pain must have its origin within the alimentary tract; many of its features suggest that it arises in the oesophagus, but the interval of three or four hours between food and the onset of pain raises the possibility of pain referred from the duodenum. It is clearly a symptom which requires investigation, for no diagnosis can be made on the history alone, and obviously no treatment can be prescribed until a diagnosis has been made. A careful radiological examination of the oesophagus, stomach, and duodenum is the first step; an oesophagoscopy may be indicated later. These suggestions are offered on the assumption that physical examination is normal.

Chemical Contraceptives

Q.—*Many patients complain of the expense of proprietary contraceptives. Can a prescription be given for a chemical contraceptive jelly that is cheap and effective?*

A.—Unfortunately the *Pharmacopoeia* contains no contraceptive preparations, and they are too complex for ordinary prescriptions. Hence one is bound to rely on the proprietary ones. All contraceptive materials prove unsuitable on rare occasions, so that it is necessary to change from one to another if there is intolerance. I have never heard of a patient responding badly to more than one of the three proprietary preparations usually advised. By the way, the Family Planning Association have had all the best-known contraceptives analysed and tested, and they can supply an approved list. This is under review at the moment and should be available again soon.

Sensitivity to Primula

Q.—*A male aged 40 complains of a rash on the body after contact with primula plants. Is there any method of desensitization?*

A.—Desensitization, preferably prophylactically, can be carried out, either orally or by injection, with various extracts of the oleo-resins from the leaves of primula plants. The results are variable and a complete prolonged immunity is exceptional; repeated pre-seasonal therapy is usually required. The details of the treatments and of the methods of preparation of the various types of extracts used can be obtained from books on allergy, such as *Allergy in Theory and Practice*, by R. A. Cooke (1947, W. B. Saunders, Philadelphia); *Clinical Allergy*, by L. Tuft (1937, W. B. Saunders, Philadelphia). A commercial extract is available. Avoidance of contact is the treatment of choice.

NOTES AND COMMENTS

Pink Disease.—Dr. LINDSAY A. DEY (Sydney, New South Wales) writes: In the *Journal* of June 21 (p. 911) there is a question and answer on pink disease. May I congratulate the writer on what he has written, especially the last sentence? When chief resident medical officer at the Royal Alexandra Hospital for Children I had under my care the first case of pink disease recognized in New South Wales. Sir Charles Clubbe had recognized it from a description sent to him by Dr. Swift, of Adelaide—it was either at the end of 1915, or more likely early 1916. I endorse every word that your writer has said. I have seen children die in hospital. I have seen children so sick that I was sure they would die, but who have recovered when taken home after a talk with a courageous mother on the lines set out in the article. The only other thing I am sure of in this disease, which is so very interesting and so easily recognized when looked for, is that it is a virus infection affecting the sympathetic nervous system. Again congratulating your contributor.

"Dyspeptic" Ulcers.—Dr. GEORGE GRAHAM (London, W.1) writes: May I suggest a different answer to the question about "dyspeptic" ulcers (July 19, p. 120). Bacteriological investigations have not revealed the presence of any bacteria which can be regarded as the causative agent, but it was shown in 1938 by Dodd, Johnstone, and Buddingh and confirmed in 1939 by Burnet and Williams that the virus of herpes simplex is the causative agent, since characteristic lesions can be produced in the cornea of a rabbit with material from the ulcer. Consequently it has been suggested that "herpetic stomatitis" is a better name than "dyspeptic" or "peptic" ulcer, or "aphthous stomatitis." Nothing is known which will prevent the patient having recurring attacks, but in my own experience they seem to come less frequently as I get older. The pain and discomfort can be greatly relieved in two ways: (1) Touching the ulcer firmly with a stick of silver nitrate. This is a very painful process but after ten minutes the pain is completely relieved for twenty-four hours. This procedure may have to be repeated once or twice before the ulcer heals. (2) The ulcer is swabbed with a 1% solution of gentian violet every three hours. This method is very useful if three or more ulcers are present at the same time, or if a single ulcer is in a rather inaccessible position.

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Judicial Hanging.—Col. N. J. C. RUTHERFORD, D.S.O. (Farnham, Surrey), writes: I have always been interested in this subject (July 26, p. 159) since the time that a prison medical officer showed me over a well-known jail and gave me a description on the spot of the last walk of the condemned man from the death cell to the garage-like building containing the equipment for hanging a man. The doctor showed, and explained to me, the mechanism of the drop into the pit, reached by a short flight of steps from the level of the platform where the condemned takes his last stand. What astonished me was the doctor's statement that as the trap is sprung and the man drops *all* the official spectators of the hanging walk out and the shed is locked for half an hour. At the end of this time the doctor returns, descends into the pit, and examines the body to ensure that life is extinct. I took it that this gruesome but necessary precaution is enforced to meet the possible failure of the fracture or dislocation of the vertebral column. I may add that it is thirty years since the prison doctor gave me this dramatic description, but I have never read of an execution since then without thinking of that half-hour of time. I suppose the operative words are "almost invariably." I wonder if this custom is still in force?

Displaced Persons.—Dr. PATRICK J. SMITH (late of U.N.R.R.A.) writes: I wish to thank each of my colleagues who so kindly sent medical literature for the use of D.P. doctors. Should anyone not have received a personal acknowledgment, I should be glad to hear from him.

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